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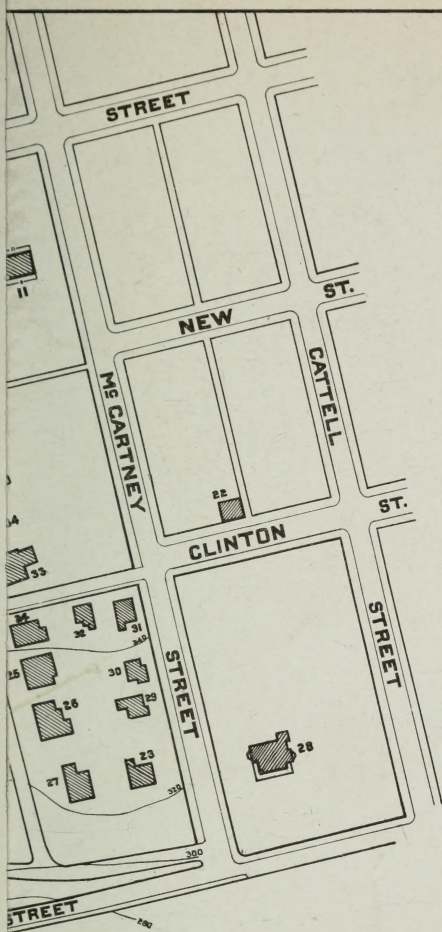
LAFAYETTE COLLEGE

GENERAL CATALOGUE

1907-1908

PUBLISHED QUARTERLY BY LAFAYETTE COLLEGE

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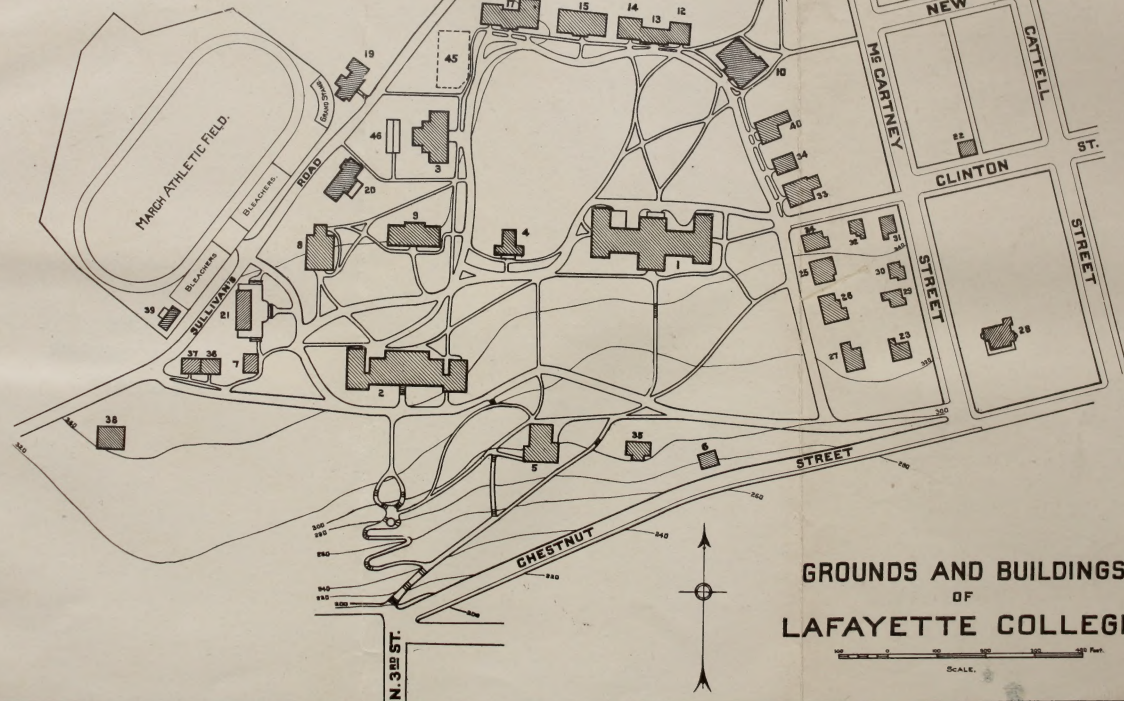


GROUNDS AND BUILDINGS OF AFAYETTE COLLEGE.

100 0 100 200 300 400 Feet.
 SCALE.

- | | | |
|--------------------------------|-------------------------|-------------------------|
| 1 Pardee Hall. | 14 Martien Hall. | 29 President Warfield. |
| 2 South College. | 15 McKeen Hall. | 30 Prof. Owen. |
| 3 Gayley Hall of Chemistry. | 16 Newkirk Hall. | 31 Prof. Wysor. |
| 4 Observatory. | 17 Knox Hall. | 32 Prof. Raschen. |
| 5 Jenks Biological Laboratory. | 18 Blair Hall. | 33 Prof. Coffin. |
| 6 Private Laboratory. | 19 Delta Kappa Epsilon. | 34 Prof. March, Jr. |
| 7 College Office. | 20 Phi Delta Theta. | 35 Prof. Hart. |
| 8 Gymnasium. | 21 Theta Delta Chi. | 36 Prof. Mecklin. |
| 9 Van Winkle Library. | 22 Sigma Chi. | 37 Mr. Smith. |
| 10 Brainerd Hall. | 23 Prof. Davison. | 38 Prof. March. |
| 11 East Hall. | 24 Prof. Youngman. | 39 Field House. |
| 12 Powell Hall. | 25 Prof. Hardy. | 40 Students' Clubs. |
| 13 Fayerweather Hall. | 26 Prof. Moore. | 41 to 45 Tennis Courts. |
| | 27 Prof. Hall. | 46 Greenhouse. |

2 and 11 to 18—Dormitories.



**GROUNDS AND BUILDINGS
OF
LAFAYETTE COLLEGE.**

B U L L E T I N O F
LAFAYETTE COLLEGE

INCLUDING THE COURSES OF STUDY
IN THE
CLASSICAL *and* SCIENTIFIC
DEPARTMENTS

EMBRACING THE
SCHOOLS *of* CIVIL, MINING *and* ELEC-
TRICAL ENGINEERING, *and of*
CHEMISTRY

SEVENTY-SIXTH YEAR

1907-1908

EASTON, PENNSYLVANIA

1908

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CALENDAR.

1907.

September 12, Thursday . . . College year began.

October 23, Wednesday . . . Founders' Day.

December 18, Wednesday. . First term ends.

1908.

January 2, Thursday.....Second term begins.

January 30, Thursday Day of Prayer for Colleges.

February 21, Friday.....Senior Prize Debate.

March 18, Wednesday.....Second term ends.

April 2, Thursday.....Third term begins.

May 11, Monday.....Junior Oratorical Contest.

May 21-25.....Final Examination of the Senior Class.

May 30, Saturday.....Memorial Day, Barge Oratorical Contest.

June 9-13.....Examination of the lower classes.

June 14, Sunday.....Baccalaureate Sermon.
Sermon before the Brainerd Society.

June 15, Monday.....Senior Class Day and Concert.

June 16, Tuesday.....Literary Societies and Class Reunions.

June 17, Wednesday.....Commencement Exercises.

June 18, Thursday.....Examinations for admission.

September 14, Monday.....Registration for entrance.

September 15-16, Examinations for admission.

September 17, Thursday.... College year begins.

October 21, Wednesday.....Founders' Day.

November 26, Thursday....Thanksgiving Day.

December 23, Wednesday.. First term ends.

1909.

January 7, Thursday.....Second term begins.

January 28, Thursday.....Day of Prayer for Colleges.

March 25, Wednesday.....Second term ends.

LAFAYETTE COLLEGE.

Lafayette College is situated at Easton, Pa., upon a site of remarkable beauty, overlooking the confluence of the Delaware and Lehigh rivers. It is thoroughly furnished with the buildings and apparatus to do the work of a progressive college and polytechnic school, and also with the equipment, so important in this age, for a healthful and wholesome student life. Its large and able faculty represent the best traditions of scholarship as well as the recent extensions of scientific knowledge and the newer methods of research. It frankly recognizes its obligation to give its students training, as well as the opportunities for acquiring knowledge, and to make its discipline include moral and spiritual culture. Recent revisions of the requirements for admission and of the courses of study have been made. It will be found that these changes meet the demands of the day for liberty of choice without sacrificing the supreme consideration of thoroughness.

The first exercises were held on May 9, 1832, and the 75th anniversary was celebrated in 1907 by exercises which marked an epoch in the history of the college. A fund was also raised by the friends and Alumni of the College for the increase of the endowment and the extension of the work of the College.

Easton is a railroad center and easily accessible from all directions. It is about seventy-five miles from New York, seventy from Philadelphia, eighty from Scranton

and one hundred from Wilkes-Barre and Harrisburg. The Lehigh Valley, Pennsylvania, N. J. Central, Phila. & Reading, D. L. & W., and L. & H. R. Railways afford convenient and rapid facilities for railway travel. It is also an important industrial center, and there are many advantages afforded the students in the Technical courses by its location. Its situation upon a lofty elevation, fronting south, and perfectly drained, also ensures the most perfect conditions for the promotion of health. The plan of the grounds and the pictures of some of the buildings give but a faint idea of the beauty of the grounds and buildings.

There are many points of interest in regard to the College and its work which it is not possible to embody in this publication. Correspondence, especially with prospective students, is therefore cordially invited.

TRUSTEES.

JOHN WELLES HOLLENBACK, <i>President</i>	Wilkes-Barre, Pa
HON. WILLIAM S. KIRKPATRICK, LL.D.....	Easton, Pa.
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HENRY W. CATTELL, M.D.....	Philadelphia, Pa.
HORACE P. GLOVER, ESQ.....	Mifflinburg, Pa.
REV. J. BALCOM SHAW, D.D.....	Chicago, Ill.
REV. JOHN B. LAIRD, D.D.....	Frankford, Pa.
ANDREW F. DERR, A.M.....	Wilkes-Barre, Pa.
WILLIAM MCMURTRIE, M.E. PH.D.....	New York City
CHARLES B. GREEN, E.M., <i>Secretary and Treasurer</i> ,	Easton, Pa.

Of the above Trustees, Messrs. Kirkpatrick, '63; Hand, '65, Gayley, '76; Snodgrass, '57; Waller, '70; Pardee, '74; Adamson, '77; Hogg, '78; Sheaffer, '78; Radcliffe, '77; Eckard, '66; Green, '83; Markle, '80; E. J. Fox, '78; King, '71; Moore, '73; Baker, '77; Cattell, '83; Glover, '71; Shaw, '85; Laird, '92; Derr, '75; and McMurtrie, '71, are Alumni of Lafayette College.

MEETING OF THE TRUSTEES.

Thursday, February 13, 1908.....ANNUAL BUSINESS MEETING.
 Tuesday, June, 16, 1908.....COMMENCEMENT WEEK.
 Wednesday, October 21, 1908.....FOUNDERS' DAY.

FACULTY.

REV. ETHELBERT DUDLEY WARFIELD, D.D., LL.D.,
President, Professor of History and Political Science.

(John I. Blair Foundation.)

FRANCIS ANDREW MARCH, LL.D., L.H.D., D.C.L., Litt.D.,
*Emeritus Professor of the English Language and Comparative
Philology.*

REV. ROBERT BARBER YOUNGMAN, A.M., PH.D.,
Professor of the Greek Language and Literature.

REV. SELDEN JENNINGS COFFIN, A.M., PH.D.
(James H. Coffin Professorship of Astronomy.)

JAMES W. MOORE, A.M., M.D.,
*Dean of the Pardee Scientific Department, Professor of Mechanics
and Experimental Philosophy.*

CHARLES MCINTIRE, A.M., M.D.,
Lecturer on Sanitary Science.

JOSEPH JOHNSTON HARDY, A.M., PH.D.,
Professor of Mathematics and Astronomy.
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WILLIAM BAXTER OWEN, A.M., PH.D.,
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Professor of Analytical Chemistry.
(William Adamson Professorship of Analytical Chemistry.)

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Francis A. March Professor of the English Language.

WILLIAM SHAFER HALL, C.E., E.M., M.S.,
Professor of Mining Engineering and Graphics.
(George B. Markle Professorship.)

JACOB D. UPDEGROVE, A.M., M.D.,
Lecturer on Hygiene, Director of Physical Training.

EDGAR MOORE GREEN, A.M., M.D.,
Consulting Physician in the Department of Physical Training.

ALVIN DAVISON, A.M., PH.D.,
Professor of Biology.
(Jesse Chamberlain Professorship of Botany.)

FREDERICK BURRITT PECK, PH.D.,
Professor of Mineralogy and Geology.

REV. JOHN MOFFAT MECKLIN, A.M., PH.D.,
Professor of Mental and Moral Philosophy and Hebrew.
(James Renwick Hogg Professorship.)

REV. JOHN FREDERICK LOUIS RASCHEN, A.M.,
Professor of Modern Languages.

HENRY WYSOR, B.S.,
Assistant Professor of Analytical Chemistry and Metallurgy.

ALLAN ROBERTS, PH.B., M.S.,
Assistant Professor of History.

LEONARD PERLEY DICKINSON, B.S.,
Assistant Professor of Electrical Engineering.

JAMES WADDELL TUPPER, PH.D.,
Assistant Professor of English Literature.

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Assistant Professor of Municipal Engineering.

STANLEY EUGENE BRASEFIELD, C.E., M.S.,
Instructor in Mathematics and Graphics.

WILLIAM DARLINGTON LITTLE, A.M.,
Instructor in Mathematics.

JAMES HENRY DELONG, B.S.,
Instructor in Chemistry.

REV. CARL FREDERIC PFATTEICHER, A.B.,
Tutor in Latin and Hebrew.

WILLIAM MACKAY SMITH, PH.B.,
Tutor in Mathematics.

JOHN WHITNEY COLLITON, C.E.,
Instructor in Mathematics.

JAMES BRYANT HOPKINS, A.M.,
Instructor in Modern Languages.

FREDERICK RAYMOND HUNT, A.B.,
Instructor in Greek and German.

ASHER SEIP, A.M.,
Instructor in Municipal Law.

JOHN ROYDEN HESS, PH.B.,
Instructor in Chemistry.

WILLIAM BENJAMIN MARQUARD, E.M.,
Instructor in Mining.

WARREN CHAMBERLAIN TUDBURY, B.S.,
Instructor in Railroad Engineering.

HARRY DANIEL BAILEY, A.B.,
Assistant in Biology.

EDWARD FRANKLIN FARQUHAR, A.B.,
Assistant in English

JOSHUA LEWIS MINER, A.B.,
Assistant in Cement Laboratory.

COLLEGE OFFICERS.

ROBERT BARBER YOUNGMAN, PH.D.,

Clerk.

JAMES W. MOORE, A.M., M.D.,

Inspector of Buildings.

SAMUEL L. FISLER, A.M.,*

Supt. of Grounds and Construction of Buildings.

REV. JOHN F. STONECIPHER, D.D.,

Librarian.

REV. MAURICE A. FILSON, A.M.,

Assistant in Library

EDWARD HART, PH.D.,

Curator of Gayley Hall, and Librarian of the Henry W Oliver Library.

CHARLES B. GREEN, E.M.,

Registrar and Treasurer.

ALBERT MOORE LANE, PH.B.,

Assistant in Treasurer's Office.

CLASS DEANS.

SENIOR CLASS.....The President.

JUNIOR CLASS.....Professors Mecklin and Peck.

SOPHOMORE CLASS.....Professors Youngman and Hall

FRESHMAN CLASS.....Professors Hardy and Owen.

* Died January 15, 1908.

LAFAYETTE COLLEGE.

ADMISSION.

Every applicant for admission to the College is expected to report at the College offices and register immediately on his arrival. Before registering he must submit to the Registrar a satisfactory certificate of moral character from his pastor or some other person known to the College authorities, and a diploma or certificate of graduation from the school which he last attended, or, if he be not a graduate, a statement that he leaves the school with the approval of its principal and is honorably dismissed to this College, with a statement of the studies which he has pursued and the course which he desires to pursue. His application having been approved he is admitted to the examinations. Examinations are regularly held on the day following the annual commencement day in June, and the days preceding the first day of the autumn term in September, and also on the first day of the second and third terms.

Special attention is called to the changes in the entrance requirements since the publication of the 1905-'06 Catalogue. Candidates may now offer either German or French, and either Natural Philosophy or Chemistry, for admission to the Latin Scientific, General Scientific and Technical Courses.

REQUIREMENTS FOR ADMISSION TO THE FRESHMAN CLASS.

CLASSICAL COURSE.

For admission to the Classical Course candidates are examined in the following subjects:

Geography (A) and (B)	English.
History (A) and (B).	Latin.
Mathematics (A).	Greek.

(For details of subjects, see pages 15-19.)

LATIN SCIENTIFIC COURSE.

For admission to the Latin Scientific Course candidates are examined in the following subjects:

Geography (A) and (B).	English.
History (A) and (B).	Latin.
Mathematics (A).	German (A) or French (A).
Natural Philosophy or Chemistry.	

(Candidates for the Classical and Latin Scientific Course offering Mathematics (A) and (B) can take advanced courses in Mathematics.)

GENERAL SCIENTIFIC COURSE.

For admission to the General Scientific Course candidates are examined in the following subjects:

Geography (A).	English.
History (A).	German (A) and (B) or French (A)
Mathematics (A).	and (B).
Natural Philosophy or Chemistry.	

and one of the following subjects Mathematics (B); a Second Modern Language (A) and (B); Latin (Grammar. 4 books of Caesar and 2 orations of Cicero or an equivalent).

CIVIL, MINING AND ELECTRICAL ENGINEERING AND CHEMICAL COURSES.

For admission to the Schools of Engineering and Chemistry candidates are examined in the following subjects:

Geography (A).	English.
History (A).	Natural Philosophy or Chemistry.
Mathematics (A) and (B).	German (A) and (B) or French (A)
	and (B).

DETAILS OF SUBJECTS REQUIRED FOR ADMISSION TO THE FRESHMAN CLASS.

GEOGRAPHY (A).—Political or Physical Geography.

GEOGRAPHY (B).—Ancient Geography.

HISTORY (A).—*United States*: Johnston, McMaster or Fiske.

General History: Fisher or Freeman. Such books as Myers' and Swinton's General History are not recommended.

HISTORY (B).—*Roman History* to Augustus, and *Greek History* to Alexander. The requirements are intended to be additional to the requirement in General History, and should be met by the use of books on Roman and Greek History, such as Myers', "Rome, Its Rise and Fall;" Morey's, Leighton's, or Allen's Roman History, and Morey's or Oman's Greek History.

MATHEMATICS (A).—*Arithmetic*: Complete, including the Metric System.

Algebra: Fundamental principles. Factoring. Fractions. Simple Equations. Involution. Evolution. Exponents. Quadratic Equations. Simultaneous Quadratic Equations. Equations solved as Quadratics. Properties of Quadratic Equations.

Geometry: Plane Geometry entire: as in Wentworth, Wells or Loomis.

MATHEMATICS (B).—*Solid Geometry*.

Algebra.—Surds and Imaginaries. Simple Indeterminate Equations. Inequalities. Ratio. Proportions and Variations. Progressions.

Plane Trigonometry.—Through the solution of right and oblique triangles (Crawley or an equivalent); candidates should bring their logarithmic tables to the examination.

NATURAL PHILOSOPHY.—The elementary principles (Avery, Gage, Hall and Bergen or Carhart and Chuter.)

CHEMISTRY.—Elements of Inorganic Chemistry.

ENGLISH.—*Grammar*: A general examination will be given with special reference to any particular text-book to test familiarity with paradigms and syntactical analysis, and the correct use of English idioms.

Franklin's Autobiography and *Milton's Paradise Lost*, Books I and II; to be thoroughly studied as to subject-matter, form, and structure including the language used, as to its etymology, syntax, and prosody.

Prose Composition: The writing of a short essay will be required upon a subject drawn from the foregoing text-books. No candidate will be accepted in English whose work is notably deficient in point of spelling, punctuation, idioms, or division into paragraphs.

The works recommended for study by the Association of Colleges and Preparatory Schools of the Middle States and Maryland will be accepted in place of Franklin and Milton, as follows:—

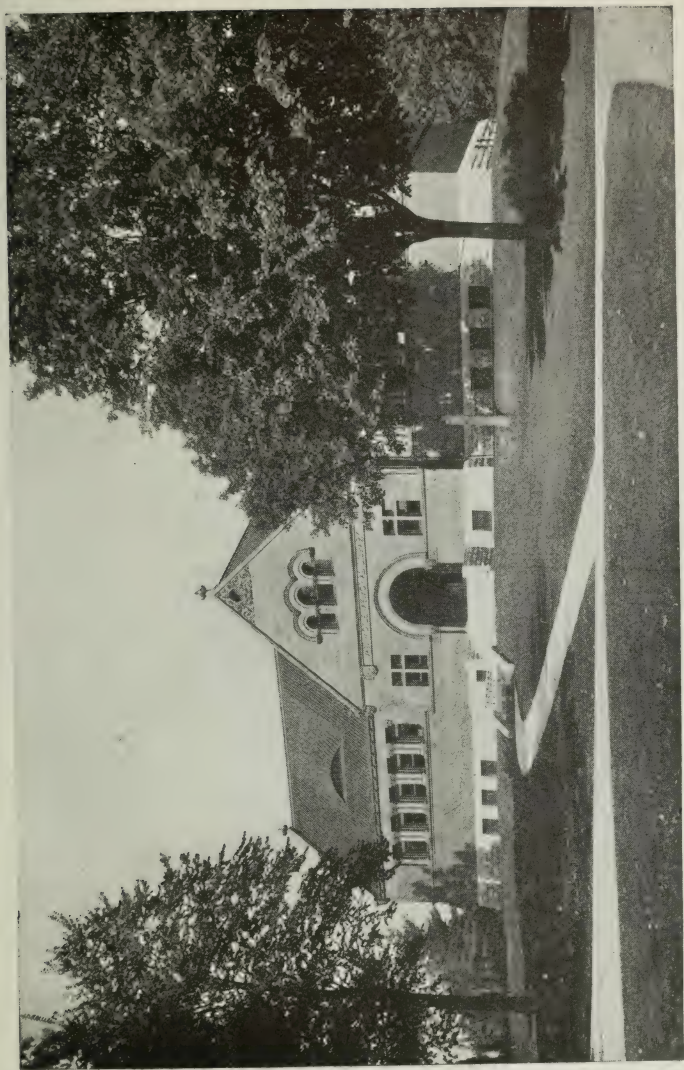
For 1906, 1907, 1908: Shakespeare's *Julius Caesar*; Milton's *L'Allegro*, *Il Penseroso*, *Comus*, and *Lycidas*; Burke's *Speech on Conciliation with America*; Macaulay's *Essays on Milton* and *Addison*; Lincoln's *Gettysburg Address*.

1909, 1910, 1911: Shakespeare's *Macbeth*; Milton's *Lycidas*, *Comus*, *L'Allegro*, and *Il Penseroso*, Burke's *Speech on Conciliation with America*, or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*; Macaulay's *Life of Johnson*, or Carlyle's *Essay on Burns*.

In addition, the candidate may be required to answer questions involving the essentials of English grammar, and questions on the leading facts in those periods of English literary history to which the prescribed works belong.

Reading: Every candidate must have read a certain number of works of English literature. It is expected that the reading shall be done under the direction of an instructor and accompanied by frequent examinations during the preparatory course, for which four years is appropriate.

The candidate will be required to present evidence of a general knowledge of the subject-matter, and to answer simple questions on the lives of the authors. The form of examination will usually be the writing of a paragraph or two on each of several topics, to be chosen by the candidate from a considerable number—perhaps ten or fifteen—set before him in the examination paper. In place of a part or the whole of this test, the candidate may present an exercise book, properly certified by his instructor, containing compositions or other written work done in connection with the reading of the books. In preparation of this part of the requirement, it is important that the candidate shall have been instructed in the fundamental principles of rhetoric



VAN WICKLE MEMORIAL LIBRARY.

The books set for this part of the examination will be those recommended by the Association of Colleges and Preparatory Schools of the Middle States and Maryland, as follows:—

For 1906, 1907, 1908: Shakespeare's *Macbeth* and *The Merchant of Venice*; *The Sir Roger de Coverley Papers* in *The Spectator*; Irving's *Life of Goldsmith*; Coleridge's *The Ancient Mariner*; Scott's *Ivanhoe* and *The Lady of the Lake*; Tennyson's *The Passing of Arthur*, and one of the three Idyls, *Elaine*, or *Geraint and Enid*, or *Gareth and Lynette*; Lowell's *The Vision of Sir Launfal*; George Eliot's *Silas Marner*.

1909, 1910, 1911:

Group I (two to be selected).

Shakespeare's *As You Like It*, *Henry V*, *Julius Caesar*, *The Merchant of Venice*, *Twelfth Night*.

Group II (one to be selected).

Bacon's *Essays*; Bunyan's *The Pilgrim's Progress, Part I*; *The Sir Roger de Coverley Papers* in *The Spectator*; Franklin's *Autobiography*.

Group III (one to be selected).

Chaucer's *Prologue*; Spenser's *Faerie Queene* (selections); Pope's *The Rape of the Lock*; Goldsmith's *The Deserted Village*; Palgrave's *Golden Treasury (First Series) Books II and III*, with special attention to Dryden, Collins, Gray, Cowper and Burns.

Group IV (two to be selected).

Goldsmith's *The Vicar of Wakefield*; Scott's *Ivanhoe*; Scott's *Quentin Durward*; Hawthorne's *The House of the Seven Gables*; Thackeray's *Henry Esmond*; Mrs. Gaskell's *Cranford*; Dickens' *A Tale of Two Cities*; George Eliot's *Silas Marner*; Blackmore's *Lorna Doone*.

Group V (two to be selected).

Irving's *Sketch Book*; Lamb's *Essays of Elia*; De Quincey's *Joan of Arc* and *The English Mail Coach*; Carlyle's *Heroes and Hero Worship*; Emerson's *Essays* (selected); Ruskin's *Sesame and Lilies*.

Group VI (two to be selected).

Coleridge's *The Ancient Mariner*; Scott's *The Lady of the Lake*; Byron's *Mazeppa* and *The Prisoner of Chillon*; Palgrave's *Golden Treasury (First Series) Book IV*, with special attention to Wordsworth, Keats and Shelley, Macauley's *Lays of Ancient Rome*; Poe's *Poems*; Lowell's *The Vision of Sir Launfal*; Arnold's *Sohrab and Rustum*; Longfellow's *The Courtship of Miles Standish*; Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur*; Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Evelyn Hope*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *The Boy and the Angel*, *One Word More*, *Hervé Riel*, *Pheidippides*.

LATIN.—*Grammar*: The Roman method of pronunciation is used.
Caesar: Commentaries, four books, for a portion of which an equivalent in Nepos will be received.

Cicero: Orations, seven.

Virgil: Æneid, six books; *Bucolics*.

Prose Composition: Daniell's, or equivalent.

GREEK.—*Grammar*: Pronunciation according to the written accents and in accordance with the preface to Goodwin's *Grammar* or Hadley-Allen's, Sections 11, 14, 19, 20, 21.

Xenophon: Anabasis, four books, for a portion of which an equivalent in *The Cyropaedia* will be received.

Homer: Iliad or *Odyssey*, three books; or

New Testament: Gospels, three.

Prose Composition: Collar and Daniell, or equivalent.

GERMAN (A).—An accurate knowledge of the principles of grammar, especially the inflection of articles, adjectives, pronouns, and nouns; the conjugation of the weak and strong verbs; the uses of the modal auxiliaries; the prepositions and their government; the elementary rules of syntax and word order; to be able to read at sight ordinary German prose. It is believed that this requisite facility can be acquired by reading not less than two hundred duodecimo pages of simple German.

GERMAN (B).—This includes a thorough knowledge of accidence of the elements of word-formation, and of the principal uses of the prepositions and conjunctions. The candidate should be familiar with the essentials of German syntax, and must possess the ability to translate into German easy English prose; to translate at sight passages from standard classical authors. The reading of at least three hundred and fifty pages in addition to that required under German (A) will develop such ability. For examination no specific authors or work are designated. All candidates are required to bring a statement from their teacher, mentioning text-books used and authors read, including the number of pages translated.

FRENCH (A).—This embraces a thorough knowledge of the rudiments of grammar, including the inflection of the regular and the more common irregular verbs; the inflection of nouns and adjectives for gender and number; the uses of articles and partitive constructions; the forms and positions of personal

pronouns; the uses of the other pronouns. Candidates should be able to read at sight ordinary modern prose. It is believed that this ability is acquired by reading two hundred duodecimo pages from the works of at least three different authors.

FRENCH (B).—Candidates should show a thorough knowledge of accidence, and a familiarity with the essentials of French syntax, especially the uses of the tenses, modes, prepositions and conjunctions. They must be able to translate into French a connected passage of simple English, and to translate at sight standard French authors. This proficiency may be acquired by reading, in addition to that required under French (A), not less than four hundred pages of the works of various standard authors. For examination no special authors or works are designated. Applicants should present a statement from their teachers setting forth the text-books used and the number of pages translated.

PARTIAL OR SPECIAL COURSES.

In addition to the courses above specified, students may be admitted under exceptional circumstances to pursue courses of study of a special character not leading to a degree. Such students are required to undergo such preliminary examination as may be deemed necessary to ascertain their fitness to pursue the proposed course, and when admitted they are subject to the same rules and regulations and the same examinations in the studies pursued as are other undergraduates. On completing their course they will receive, on application, certificates of proficiency in such courses as they have satisfactorily completed.

ADVANCED STANDING.

Candidates for advanced standing are examined not only in the preparatory studies, but also specially in the previous studies of the class they wish to enter, or their full equivalents.

Students from another College bringing certificates of rank and honorable dismissal are permitted to recite on trial with corresponding rank in this College, until there is sufficient test of their qualifications for admission to regular standing. They will, however, be examined on whatever studies of the course may not be in the curriculum of the College from which they come, unless there are full equivalents.

No student, whether from another College or not, will be admitted to the Senior Class as a candidate for a degree after the beginning of the second term.

CONDITIONS.

Students who fail to pass in a part of the subjects in which they are examined may be admitted upon the condition that they pass a satisfactory examination on such subjects before the end of the term next after that in which they enter. The number of such conditions with which a student is admitted to the College will be determined in each case by a vote of the Faculty.

CERTIFICATES.

Certificates of the Examination Board of the School and College Association of the Middle States and Maryland, of the Regents of the University of the State of New York and of certain approved preparatory schools are received in lieu of examination for entrance. Certificates, which will be accepted only from graduates of regularly prescribed preparatory courses, must be signed by the Principal and certify only to work done during school hours. They should be filed with the Registrar before the entrance examination in June. Blank certifi-

cates will be furnished upon application. Wherever the certificate does not cover one or more of the requirements of admission or supply a satisfactory equivalent, an examination upon such subject or subjects will be required. Such certificates will not be received after one year from the completion of the period of study for which they are given unless an additional certificate of continued study accompany them.

MATRICULATION.

No student is considered a regular member of the College until after his matriculation, which takes place thirty days after his entrance. During the interval between his admission and matriculation he is, however, in all respects subject to the laws of the College.

COURSES OF STUDY REQUIRED OF ALL DEPARTMENTS.

All the courses of study are so arranged as to provide for at least three lectures or recitations each week-day except Wednesday and Saturday, which are half-holidays, there being no afternoon recitation. Wednesday evening is set apart for the Literary Societies, and in order to co-operate with their work the first exercise on Thursday morning is given to elocution. Every student is expected to conform to this arrangement of hours. Special students must arrange a schedule of sixteen weekly exercises. One recitation hour is regarded as the equivalent of three hours of field and laboratory work.

BIBLICAL INSTRUCTION.

The morning recitation in every class of all departments on Monday in each week is given to Biblical instruction. In the Freshman year a general view of the contents of the Bible and of each book is given, with special attention to chronology, history and geography. The class is divided into four sections, instructed by Profs. Hardy and Lyle and Messrs. Smith and Colliton. The text books are the English Bible and Coleman's Geography of the Bible. In the Sophomore year the Acts of the Apostles is studied. The students in the Classical Course read the book in the original Greek with Prof. Youngman; those in the Latin Scientific in Latin with Prof. Owen. and the Technical divisions in French with Mr. Hopkins and Mr. Hunt. Special attention is given to

the lives and labors of the Apostles and to the founding of the Christian Church. In the Junior year the Epistle to the Romans is studied. The students in the Classical Course read it in the original with Prof. Mecklin in the Latin Scientific with Mr. Pfatteicher in Latin, and in the Technical courses with Prof. Raschen. It is studied with reference to language and doctrine. In the Senior year a course, in which Uhlhorn's Conflict of Christianity and Heathenism is used as a text-book, is given during the first half of the year by the President, and during the remainder of the year in the History of the English Bible. In addition to these courses the Old Testament in the original Hebrew is offered as an elective study in the Senior year.

It is intended that the Bible shall be a central object of study throughout the course. It is dealt with reverently as the Word of God, and as the inspired and infallible rule which God has given to His people.

In connection with the study of the Bible, certain prizes were established by the Rev. Lyman Coleman, D.D., sometime professor of Biblical and Physical Geography in Lafayette College. These prizes are awarded at the end of Freshman year. (See page 147.)

PHYSICAL CULTURE.

HUMAN PHYSIOLOGY.

The lectures on Health to the Freshman Class include the general principles of Physiology and Anatomy, and are thorough and practical, and illustrated by diagrams.

THE GYMNASIUM.

The College has ample ball grounds, tennis grounds, and boating facilities, a light, airy, tasteful gymnasium,

thoroughly equipped with the best modern appliances, dressing-room, bath-rooms, etc., and uses a thorough system of physical culture, participated in by all the students, who are required to be in the Gymnasium at set times for class drill. The Gymnasium is also open at given hours for voluntary work. Before entering the Gymnasium each student must be examined by the Medical Director, and if it is found that the regular class exercises are not likely to be healthful for him, other exercises will be prescribed suited to his constitution and condition. All the exercises in the Gymnasium are under the supervision of the Director of Physical Training.

A fine athletic field has recently been purchased and equipped by the Alumni and Easton friends of the College. It adjoins the campus on the west, and affords excellent facilities for all outdoor sports.

All athletic sports are under the careful supervision of a committee of the faculty, of which the Medical Director of the Gymnasium is a member. *No student is permitted to take part in public contests without written permission from his parents.*

CLASSICAL DEPARTMENT.

The Classical Department consists of the historic course in the *Arts*, or *Humanities*, and retains the regular character of that course, which has so long been regarded as the foundation of a liberal education. The course has a fixed curriculum during the earlier years, but in the latter part of the course latitude is allowed by the introduction of elective studies for the student to select such studies as he deems the best preparation for his subsequent pursuits.

This Department being the usual preparation for the learned professions, including teaching and journalism, special regard is given to the necessities of these professions, so that in addition to being the thoroughly tried means of securing a broad and liberal culture and an approved foundation of Christian scholarship, it is particularly fitted to prepare men for the learned professions. It is also recognized as a desirable preparation for other pursuits, including scientific and technical professions, wherever the circumstances of the student will permit.

The instruction embraces a systematic study of the Bible and the Evidences of Christianity throughout the course, of the Ancient and Modern Languages and their literatures, together with Comparative Philology; Pure and Applied Mathematics; Physics, Chemistry, and the Natural Sciences; Rhetoric and Elocution; Logic and Metaphysics; History and Political Science; and Mental and Moral Philosophy.

PHILOSOPHY.

Professor Mecklin.

The course in Philosophy is designed to be continuous from the beginning of the second term Junior to the end of the Senior year and consists of both required and elective work. Psychology and Logic are required during the Junior year, Ethics and History of Philosophy during the Senior year. An elective course of two hours per week is offered throughout the Senior year. The following is a synopsis of the Course:

- I. PSYCHOLOGY.—Lectures and parallel reading, three hours second term and two hours third term Junior, required. Text-book, Angell's Psychology.

- II. LOGIC.—Two hours third term Junior, required. Text-book, Creighton's Logic.
- III. ETHICS.—Lectures three hours per week first term Senior, required. Parallel reading Kant's Ethics, Mill's Utilitarianism and Muirhead's Elements of Ethics.
- IV. HISTORY OF PHILOSOPHY.—Lectures and text-book, three hours weekly second term, and two hours third term, required. Text-book, Weber or Rogers. Assigned parallel reading in Descartes, Leibnitz, Locke, Berkeley, Hume and Kant.
- V. ELECTIVE.—Two hours weekly throughout the Senior year, the subjects to be announced each term by the instructor. These Courses are designed to supplement the required Courses in Philosophy and include such subjects as Advanced Psychology, Types of Ethical Theory, Greek Philosophy, German Idealism, Aesthetics, History of Education, &c.

HISTORY AND POLITICAL SCIENCE.

The President and Professors Youngman, Owen and Roberts.

The work of this department is designed to give such a general knowledge of History and Political Science as belongs to a liberal education. At the same time sufficient work is offered in the electives to prepare those students who desire to take up graduate work, or to engage in the practice of law or the public service, or teaching. The instruction is given by text-book, by lectures, and by library references, the students reporting the results of their reading partly during the regular work of the class, and partly in the form of essays. The subjects covered by the course are in detail as follows:

ANCIENT HISTORY.

Professors Youngman and Owen.

In connection with the courses in Latin and Greek a

very careful survey is given of Ancient History, but especially of the history of Greece and Rome. The topics immediately connected with the authors read are given particular attention, but an attempt is made to bridge the period intervening, and as the authors represent the most important periods of the history of Greece and Rome the result is that the historical accent is rightly placed. Attention is given not merely to the political history of the various periods under discussion but also to the social, literary and philosophical history of each epoch. The close relation which exists between History and Geography is recognized, and a careful study of Classical Geography forms a part of the course.

HISTORY OF ENGLAND.

The President and Professor Roberts.

An elective course in English History is offered in the first and second terms of Junior year. The narrative history of England is made the basis of study, but especial attention is given to the economic, social, and intellectual history of the country, and to the development of English institutions. The general aim of this course, in its method, is to prepare for the courses in American History. Greene's Short History of the English People is used as a text-book, and the importance of collateral readings is emphasized.

AMERICAN COLONIAL HISTORY TO 1783.

The President and Professor Roberts.

This course is offered as an elective in the second term Junior year, and is intended to trace the beginnings of the American nation rather than the details of the history of the individual colonies. Emphasis is there-

fore laid on the European inheritance brought to this country by the colonists, their development of American institutions in the new environment, the expansion of population, the struggle between France and England for North America, the underlying causes of the Revolution, the growth of independence and union, Thwaite's *The Colonies* and Hart's *Formation of the Union* are used as text-books, supplemented by lectures, readings, and reports.

CONSTITUTIONAL HISTORY.

THE UNITED STATES.

The President and Professor Roberts.

A required course is given in the third term of the Junior year, dealing with the Constitution from the point of view of its historical development. Fiske's *Critical Period of American History* is used as an introduction to this course, and it is accompanied by a critical study of several important constitutional documents, such as *Magna Charta*, the *Petition of Rights*, the *Articles of Confederation*, and the *Ordinance of 1787*. Then the Constitution is taken up section by section and studied with reference to its historical development and its subsequent interpretation and construction.

This course is followed by a course dealing with the constitutional history of the first seventy years under the Constitution, which undertakes to investigate the more important constitutional questions of the early years of the Republic with sufficient thoroughness and care to give the student a firm grasp of a sound method of historical study.

The study of American institutions is interrupted in

the first term of Senior year by a course in general constitutional history, but is resumed in the second and third terms with a wider outlook. A more detailed study is now given to the whole subject, with Bryce's *American Commonwealth* as an introduction and general guide. It is supplemented by lectures and discussions.

These three courses are designed to give a broad and intelligent basis for American citizenship, and to prepare the way for original investigation in American history. The Ward Library is rich in material for special studies, and every effort is made to encourage the student to make independent researches.

GENERAL CONSTITUTIONAL HISTORY.

A course in General Constitutional History is begun as a required course in the first term of the Senior year and continued as an elective through the second and third terms. It begins with the origin of the State, and following the plan of Woodrow Wilson's *The State*, pursues the development down to the present time. The recitations are supplemented by lectures and reading, with written reports of investigations.

POLITICAL SCIENCE.

The President, Professor Roberts and Mr. Seip.

This Department embraces courses in the elements of International Law, and in the origin and development of the State in the first term of Senior year, and in Political Economy in the second and third terms of Senior year, and elective courses by Mr. Seip in *Blackstone's Commentaries*.

The course in International Law undertakes to do little more than to exhibit the fundamental principles which govern international affairs, and by the study of a few important cases to show the method of diplomatic procedure. It is especially intended to give the students the information needed to understand current discussions of foreign relations. In the history of the State, Prof. Woodrow Wilson's book is used, and is supplemented by lectures illustrating the analytical method.

The course in Political Economy consists of a rapid survey of the principles during second term Senior year, and to the discussion of practical applications of economic theories during the third term. Special attention, however, is given to the questions which are vital issues of the day, such as Finance and the Tariff. The utmost care is taken to avoid the teaching of party politics under the guise of Economic Science. At the same time the teaching in this Department recognizes the importance of inculcating honest views on the money question and the right of American citizens to know what can be said for the American policy of Protection both in the abstract and in its actual workings.

All these courses are supplemented by papers, essays and debates. The Literary Societies and the public debates do much to stimulate interest in the class work, and to give it practical application.

RHETORIC AND ELOCUTION.

The course in Rhetoric includes earlier instruction and praxis in Diction, Figures of Speech and Style, and later in Invention and in the Principles of Rhetorical Criticism; and these applied to required practice in the writings of original essays, orations and themes.

Besides the study of text-books, weekly written essays are required, and declamations in class or before the College. *Extemporaneous Speaking* is also cultivated. In those studies, such as Mental Philosophy, in which the recitation can be had by topics, students are required to take the floor daily and present an outline of the author's thought. Extemporaneous (unwritten) debates are also had in class. The Juniors, during the third term, and the Seniors deliver unwritten addresses on subjects of their own choice. The other classes speak selected pieces. Great pains are taken to encourage the habit of simple and earnest communication of connected thought.

THE GREEK LANGUAGE AND LITERATURE.

Professor Youngman and Mr. Hunt.

The aim of the Greek Course is to be thoroughly grounded in Greek forms, idioms, and syntax—to learn the composition of words, the formation of phrases, and the construction of sentences. In the earlier part of the course there is a daily lesson in the grammar, with a test of the student's ability to apply it to the text just read. Etymologies and English derivatives are constantly called for.

The best passages of the best representative authors are translated into the best attainable English. In poetry there is a study of Homer, Sophocles, and Aristophanes; in prose, of Herodotus, for history; of Æschines and Demosthenes, for oratory. For ethical questions there is a study of Socrates in the *Memorabilia* and the *Apology*.

Attention is directed to Greek life education, faith,

religion, and habits of thought and expression, as compared with our own. The old Greek citizen and the modern American citizen are brought face to face.

Essays are also called for giving the results of the student's researches. When De Corona is read there is a special class debate on the relations of Æschines and Demosthenes with Philip. When Homer is read there are references to the Bible for comparison of faith, religion, and form of expression. There is an attempt to bring the students to an intelligent appreciation of the beauty and grace and force in Greek literature, to cultivate the taste, regulate the heart, and discipline the mind.

THE LATIN LANGUAGE AND LITERATURE.

Professor Owen and Mr. Pfatteicher.

It is the aim of this Department to give the students an intelligent acquaintance with the language, literature, and institutions of Rome, and qualify them for the efficient treatment of these subjects as teachers, or for the further scholarly pursuit of these and kindred studies after graduation if they should be so disposed. We try to unite accuracy in details with facility in reading within the limits of a reasonable range.

The authors read are those which present the Latin language and literature at different stages, but mainly at its best; and the method of pursuing them is based on the belief that the best way to master these great works of genius, whether in their linguistic or literary aspects, is by the minute and careful study of selected passages. Such passages are examined, therefore, clause by clause and word by word, the common matters of grammar

and idiom coming first. In the earlier parts of the course there is a grammar lesson with each recitation, and the application of grammatical principles to the text in hand forms an important part of the daily drill. The elementary principles of phonology and a review of etymology and general syntax are thus treated in the Freshman year, and in the Sophomore year a more exhaustive study of moods and tenses and the formation of words. Then come questions of style, the author's habits of diction, his use of synonyms, rhetorical forms of speech, the arrangement of words, etc., and, if poetry, the significance of metrical forms.

Literary and historical allusions are looked up, also mythology, biography, geography, antiquities, everything, in short, which can help to clear up the author's meaning.

Aside from these incidental inquiries in connection with every text, various collateral branches of study are regularly pursued from term to term. There is the topical study of history in connection with Livy and Cicero (*De Oratore*); of antiquities in connection with Horace; of literature in connection with Latin Hymns and Tacitus; and of the history of philosophy in connection with Cicero (*De Officiis*).

A brief course in Roman archaeology is also given, illustrated by an extensive collection of Roman photographs.

It is kept in mind, also, that the training in this Department should be practically helpful and valuable to those who are to speak and write the English language. With a view to cultivate the power of expression, besides the oral work of the class-room, there are frequent exercises in writing, in which it is sought to faithfully

render the author into the English of our literary standards.

In preparation for the course in Comparative Philology given in the Senior year by Professor March, attention is called to the history of inflection, the origin and significance of the affixes of case, number, tense, mood, voice; to the physiology of speech, the regular weakenings of sound, and a comparison of forms in the Latin, both etymological and syntactical, with the corresponding forms in the Greek and English.

The Latin is pronounced according to the Roman method. Harper's New Latin Lexicon is used; Allen & Greenough's Latin Grammar (new edition) is used as a text-book; Lane and Gildersleeve, and the larger grammars of Madvig and Roby will be found helpful for references.

THE HEBREW LANGUAGE.

Professor Mecklin.

Hebrew is an elective study in the second and third terms of the Senior year. As preparatory to more advanced work, special attention is given to the etymological principles of the language, and also to the inflexions and laws of euphonic changes. To apply these principles, and to acquire a good working vocabulary, portions of Old Testament History are read, and translations made from English into Hebrew. The text-book used is Prof. Green's Elementary Hebrew Grammar.

ENGLISH LANGUAGE, COMPARATIVE PHILOLOGY.

Professors Francis A. March (Prof. Emeritus), F. A. March, Jr., J. W. Tupper, and Mr. Farquhar.

For training in speaking and writing English correctly

every student is required to hand in two themes in every term of his college course after the Freshman year. Many of them are read in class and criticized as time allows. In this work professors of all departments take part. It is desired that students in each department shall write on subjects connected with it in the words and phrases current among experts, and know the precise meaning of these words and phrases. In these matters the professors in each department are authorities. During the Freshman year a new course is being presented in the theory and practice of English Composition. The theory is taught throughout the year in lectures and recitations, and the practice obtained in daily themes, some of which are written in the class-room under the eye of the professor. Longer themes are prepared at intervals of a fortnight, and regular consultation hours are appointed at which each student is required to discuss his work with his instructor.

In addition to this the professors of foreign languages recognize that translation into English is training in English as well as in the foreign languages, and written translations are required partly in the interest of English study.

The study of the language in literature is different from the training just described. Its immediate purpose is the interpretation of masterpieces, the rethinking of the thoughts of master minds. It needs all the philological knowledge which can be had to clear up and illuminate the language. Such study also furnishes the materials and invites the inductions of systematic and historical philology and theories of the growth of literature. It must be largely comparative study, and in the

Classical Course it is thought best to defer it until the student has become acquainted with other languages. This work is given as one of the electives during the Junior and the Senior years. It is begun in the first term of Junior year with the study of Bacon's Essays. Anglo-Saxon is taken up in the second term of the Sophomore year, and is continued in the Junior year in connection with the study of Milton, during the second term.

In the third term Shakespeare is studied, and recited four times a week, and there are optional courses and prize examinations on Shakespeare in general, and English before Chaucer.

In the Senior year courses in Shakespeare and in the English Romantic Poets are given during the first term. In the second term a course in English Novels is given, and the study of the Romantic poets continued. Four hours a week of the third term are devoted to Comparative Philology, as a required study, summing up the results of former special studies and arriving at laws of language in general. For further details see page 66.

GERMAN AND ROMANCE LANGUAGES.

Professor Raschen and Messrs. Hopkins and Hunt.

The work of this Department is based upon the view that the aim of the American College is not to make specialists but to give a many-sided, well-rounded education; hence the different branches of the curriculum must in their very nature be co-ordinated with each other and the time allotted to each limited. It follows from this co-ordination and from the limited time allotted to each of the several branches, that in the pursuit of linguistic studies in the modern Continental

languages only such a method is possible that permits in the time given to reach the result which it is proposed to achieve. This result is simply to give to the student the beneficial mental development resulting from a thorough linguistic training; a result formerly reached by the exclusive study of the dead languages and now sought by the study both of ancient and modern languages, either in conjunction, as in the Classical and Latin Scientific courses, or by the modern languages exclusively, as in the General Scientific and Technical courses. And, secondly, to acquaint the student with the masterpieces of modern literature, scarcely, if at all, inferior in literary value, and certainly not less important for the proper equipment of the cultivated scholar, than the works of the great masters of Greek and Latin.

We propose—

(a) To teach the present status of the grammar and vocabulary of the languages studied.

(b) To show how they acquired their present status.

(c) To introduce the study of the best writers of Germany and France in a progressive series, with special attention to contemporary literature, and, in a limited degree, to extend the same method to the literature of Spain and Italy.

(d) To trace the development of literature and to give an account of the principal writers whose works are studied.

Italian or Spanish is offered as an elective in the second term of the Junior year.

Der Deutscher Verein is an organization of students and officers interested in the study of German language

and literature, and of German life and culture. Meetings are held fortnightly on Friday. Advanced students and others who desire to keep up their knowledge of German are invited. The programs consist chiefly of conversations, addresses and the singing of German songs.

While the required courses in the Modern Languages are chiefly linguistic, the elective courses are designed to promote study in the field of Literature. There will be lectures by the instructor, reading and critical study of assigned texts, discussions and papers on the work and author studied.

SYNOPSIS OF COURSES.

GERMAN 1. *Elements of German*.—Prescribed for Sophomores in the Classical Course and for Freshmen in the Latin Scientific Courses who offered French at Entrance. Third term, two hours. This Course in conjunction with Course 2 aims to give a thorough and accurate training in the rudiments of Grammar, to familiarize the student with spoken German as well as written; for this reason the inductive method will be employed, using German almost entirely from the beginning. In this manner the student is quickly made to acquire both 'Sprachgefühl' and 'Sprachmaterial' so as to read German with ease. Composition and translation of easy graduated texts form part of the exercises each hour.

GERMAN 2. *Elements of German*.—Prescribed for Juniors in the Classical Course. First term, three hours. This Course is a continuation of Course 1

GERMAN 3-4. *Intermediate German*.—Elective second and third terms. Two hours.

Reading of novels and dramas by modern writers such as Heyse, Keller, Fulda, Mörike, Sudermann.

GERMAN 5-6-7. *Advanced German*.—Prescribed for Freshmen in the Latin Scientific Course. Three terms, four hours.

The study of accidence, syntax and etymology will form part of this Course. In connection with this, there will be oral

practice in German and Composition as well as reading of advanced texts. These texts will be selected so as to vary the reading and to acquaint the student with a variety of style of German writers. In addition to this an easy text will be assigned for outside reading during the second and third terms.

GERMAN 8-9-10. *Selected Works of Lessing*.—Prescribed for Sophomores in Latin Scientific Course. First and second terms, two hours.

This course provides for a study of the life of Lessing with parallel readings from his works. There will be occasional lectures on the literary, historical, and aesthetic aspects of the works studied. An English biography of Lessing will be used for reference.

GERMAN 11-12-13. *Schiller and Goethe*.—Open to those who have completed two of the preceding courses. Two hours throughout the year.

The lives and several of the principal works of these authors will be studied. Lectures on the various aspects of these works are given to supplement these studies and readings in biography and criticism assigned.

GERMAN 14-15-16. *History of German Literature*.—From the earliest beginnings to the end of the eighteenth century. Open to those who have completed Course 8-10 or 11-13. Two hours throughout the year.

In this course Robertson's *History of German Literature* will be used as a reference book. The readings will be from Mueller's *German Classics*.

GERMAN 17-18-19 (alternates with German 14-16). *Goethe's Faust*.—The reading and interpretation of *Faust*, the First Part in its entirety, the Second Part in selected portions. The study will comprise its genesis, significance, ethics, and artistic character. It is open to those who completed the course on Goethe. (Not given in 1908.)

FRENCH I.—For beginners. Prescribed for Sophomores in the Classical and Latin Scientific courses. Two hours throughout the year. Fraser and Squair's *Grammar*; composition; sight-reading and translation of easy prose; careful drill in pronunciation.

FRENCH Ia.—Continuation of foregoing; thorough study of irregular verbs; grammar; composition; translation and sight-reading of more difficult prose selections from Lazare's *Premières Lectures* or selected stories from Dumas fils, Halévy, Lavedan, etc.

FRENCH Ib.—Grammar and composition continued; translation and sight-reading from Guerlac's *Standard French Authors*; discussion of the various works of the authors represented.

FRENCH II.—Readings in French history from Lavis's *Histoire de France*; discussions.

FRENCH IIa.—The Novel. Selections from Dumas' *Les Trois Mousquetaires* or Hugo's *Notre Dame*.

FRENCH IIb.—The School of the Realists. Readings from Zola's *Débauche*. Collateral reading in *History of French Literature*.

FRENCH III.—The Classical Drama—Tragedy. Study of the works of Corneille, Racine and Rotrou. Lectures.

FRENCH IIIa.—The Classical Drama—Comedy. Works of Molière

FRENCH IIIb.—Rise of the Romantic School. Hugo's *Ruy Blas* or *Hernani*.

FRENCH IV.—The Literature of the XVIth Century. Selections from Ronsard, Marguerite de Valois, Marot, Jodelle, etc. *The Pléiade*.

FRENCH V.—Historical Grammar. Development of French from Latin.

SPANISH.—This course is designed to give the elements of Spanish grammar, and to enable the student to translate easy prose from English into Spanish and *vice versa*.

ITALIAN.—A course similar to the above is offered in Italian.

MATHEMATICS.

Professor Hardy and Mr. Smith.

Soon after entrance all Freshmen are carefully examined in the preparatory Mathematics and classified according to the excellence of their preparation. The best prepared are grouped together as Division A and

the rest as Division B. Divisions A and B are further subdivided so as to secure daily instruction to each student. During the first term of Freshman year both divisions take Algebra four hours per week. During the second term Division A takes Algebra four hours per week and Division B takes Algebra two hours and Geometry two hours per week. During the third term Division A takes Trigonometry four hours per week and Division B takes Algebra two hours and Geometry two hours per week.

During the Sophomore year Division A takes Mathematics four hours per week, completing Trigonometry and beginning Plane Analytical Geometry. Division B takes Trigonometry four hours per week. During the second term Division A takes Plane and Solid Analytic Geometry four hours per week and Division B takes Plane Analytic Geometry for the same time.

The course in Analytic Geometry is begun by drawing a large number of curves from their equations, so that from the first the student may see that the properties of a curve may be studied from its equation. After that the demonstrations of the propositions usually given in the analytic geometries are constructed with the same strictness of reasoning, and every step in them is proved with the same logical rigor as in Euclid. It is hoped that at the conclusion of his demonstration the student shall see clearly and at once the meaning of every symbol in the equation obtained, and shall be perfectly sure of the truth of his conclusion. Training in clearness and accuracy of thinking is regarded as of the highest importance.

Calculus is elective for four hours per week throughout

the Junior year. During the first term the Differential Calculus is taken, during the second the Integral Calculus and during the third term the application of the Calculus to the study of Loci. Mathematics is elective for two hours per week during the Senior year. During the first term a course in Differential Equations is given and during the rest of the year a course in the Theory of Functions. The course in the Senior year is only open to those who have had Calculus.

ASTRONOMY.

Professor Hardy and Mr. Smith.

The study of Astronomy is begun in the first term of the Senior year and continued through the second and third terms. It is illustrated by practical work in the Observatory with the various astronomical instruments. The course includes a thorough study of the points and lines of the Celestial Sphere; a short discussion of the construction and use of the principal astronomical instruments; of Parallax and Refraction, and of the methods of determining Latitude, Time and Longitude. Then follows a careful study of the earth as a member of the Solar System; of the Moon; of the Sun, including the Spectroscopy of the Sun; of Eclipses; of the general laws and construction of the Solar System, and of the Planets and their Satellites. This is followed by a brief discussion of the methods of determining the Sun's Horizontal Parallax and a fuller discussion of Comets, Meteors, and the fixed Stars, including the Spectroscopy of these bodies. The course ends with a study of the general structure of the Stellar Universe and a discussion of the Cosmogony and the Nebular Hypothesis.

PHYSICS.

Professor Moore.

The studies in this Department in all the courses occupy four recitations or lectures a week for a year, beginning with the third term Sophomore year.

In Mechanics there is a thorough mathematical discussion, accompanied with lectures and experiments and laboratory work for technical students. In other subjects the study of the text-book is accompanied with illustrative lectures, aided by a valuable collection of apparatus and charts, which is continually enlarged and improved.

The course begins with an experimental demonstration of the fundamental principles of Statics and Kinetics in connection with a mathematical treatment of the subjects. This is followed by very full lectures on Heat, Magnetism, Electricity, Sound, and Light. Daily written and oral examinations impress the laws and facts thus presented upon the student.

For the advanced studies of the technical courses in Analytical Mechanics and allied topics of Mechanical and Electrical Engineering, see pages 93 and 106.

CHEMISTRY.

Professor Hart and Messrs. DeLong and Hess.

The study in this Department begins with a course of lectures on General Chemistry, combined with the study of a text-book. In connection with these lectures each student is required to work in the Laboratory under the direction of the Professor. In the Senior year an elective course in Qualitative Analysis is also offered.

Students in full standing who receive permission from the Faculty may also work in the Laboratory outside of recitation hours, if they so desire.

BIOLOGY.

Professor Davison and Mr. Bailey.

The work of this Department occupies all of the ten rooms in Jenks Biological Hall. A general laboratory, forty by sixty feet, and four special laboratories well equipped with twentieth century apparatus, in addition to an herbarium and vivarium, provide ample facilities for pursuing practical studies on plant and animal life.

The courses in Biology, excepting Sanitary Biology required for the Civil Engineers, are elective only, and consist of work throughout the Junior and Senior years. They are open for election to Classical, Latin Scientific, and General Scientific students. In order to meet the double purpose of a professional preparation and general culture, the courses are so arranged as to provide in each the special knowledge required without sacrificing the ends of general culture and discipline, which is sought in all the undergraduate courses. Those not wishing to take the complete course, and yet desiring to know the meaning of the life forms, the relation of plants and animals to one another and especially to man, and to understand the factors and methods of evolution, should pursue the work throughout the Junior year. One may, however, begin his biological studies at any time prior to the second term of the Senior year. The work of the second and third terms of the Senior years is designed for those expecting to enter the professions of teaching or medicine.

The following eight courses in Biology occupy one term each:

Course I. Botany.—Two periods are devoted to this during the first of the Junior year. The time is largely devoted to the study of the morphology and life history of the lower plants from bacteria to ferns, the physiological processes in plants, and the evolution of species. The relation of insects to plants and plants to man, together with the problem of breeding new varieties, are some of the practical topics considered. Excellent advantages for pursuing this branch are offered by the well-equipped laboratory and extensive College Herbarium containing representatives of nearly all the mosses, ferns and flowering plants found in Pennsylvania in addition to hundreds of species from other regions of North America. In its creation Dr. Porter was actively engaged for nearly half a century. It was gradually built up by personal collection, gift, exchange, and purchase, and well represents the growth of this branch of the science in the United States during this period of time. It contains the type-specimens of the species described by him. A library, also, rich in the literature pertaining to the subject, has been accumulated in the same way, and the letters received in correspondence with distinguished naturalists have been preserved.

Course II. Mammalian Anatomy.—In the first term of the Junior year, two periods per week are devoted to this branch. It enables the student to secure a definite idea of the structure of his own body, to understand some of the evidences of evolution of animals and realize the unity of structure of the animal kingdom. A dissection of parts of the cat or dog together with studies and dem-

onstrations on certain dissected mammals with special reference to the nervous system makes an excellent preparation for the study of Psychology and Philosophy. An introduction is likewise given to the natural history of the highest group of the vertebrates.

Course III. Vertebrate Zoology.—Four periods per week are given to this subject the second term of the Junior year. The laboratory work involves a study of one or more types representing each of the five classes of vertebrates.

The evolution of the various organs and systems and the origin and development of certain forms of animals together with their habits and natural history furnish fertile topics for recitations and lectures. This course, in connection with the preceding one, gives the student a general survey of the entire animal kingdom.

Course IV. General Biology.—Four periods per week are devoted to this subject in the third term of the Junior year. The morphology and life history of a few types of the invertebrates are studied with a view to understand the processes of life and the relation of one form of life to another. Darwinism and the allied problems struggle for existence, parasitism, etc., are discussed, and considerable attention is given to the interdependence of animals and plants, and insects and birds. A well-equipped laboratory with microscopes, aquaria and terraria, offering access to numerous specimens living and preserved, furnishes every advantage to those pursuing this course.

Course V. Bacteriology and Hygiene.—This work occupies four periods per week during the first term of the Senior year. A considerable amount of laboratory

work, supplemented by investigations in a well-equipped library, and by lectures and demonstrations, is applied to a study of the form, habits and use of bacteria, their relation to agriculture, to industrial processes and to disease. The cause and prevention of disease, including disinfection, disposal of sewage, sanitary analysis of water, and natural and artificial immunity, are treated in the light of the twentieth century knowledge. This course must be preceded by Course I, II, or IV.

Course VI. Physiology.—This occupies four periods per week in the second term of the Senior year. The laboratory work consists of the performance of certain experiments and a microscopic study of the chief organs in man.

The recitations and lectures are devoted chiefly to the physiological problems relating to the digestive, vascular, respiratory, excretory and nervous systems. Those electing this branch must have pursued previously either Course II, IV or V.

Course VII. Embryology and Histology. — These branches occupy six periods per week during the last term of the Senior year. The maturation and fertilization of the egg of *Ascaris*, the segmentation of the egg and the formation of the germinal layers in fish and amphibians, and the origin and early development of the chief organs in chick embryos, and the derivation and function of the fetal membranes in birds and mammals constitute the laboratory work. Discussion of these subjects, together with certain questions in cytology, such as the nature of the germ plasm, germinal selection, and heredity, occupy the hours of recitation. A brief study of the chief tissues of some mammal is also made.

Each student is required to fix, harden, embed, section, stain and mount material for microscopic work. Twenty compound microscopes, each equipped with three objectives triple nose piece, and full substage apparatus, in addition to automatic and sliding microtomes, water-baths, incubators, etc., offer excellent opportunities to those preparing for medicine or special biological work. Either Course II or III, and Course VI are required as a preparation for this course.

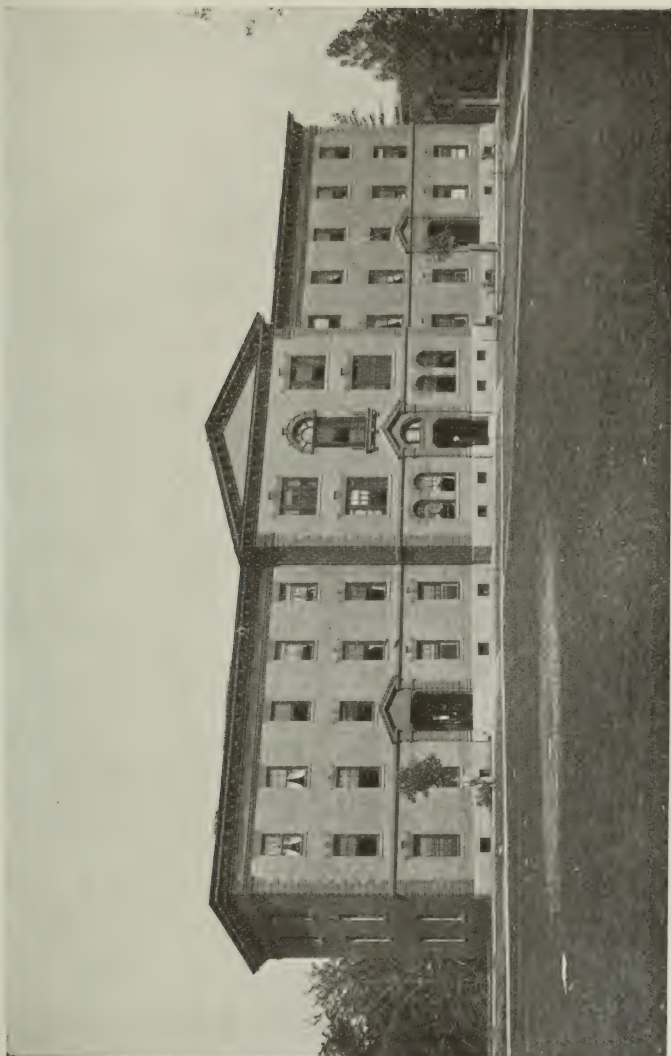
Those completing the above courses in biology in a satisfactory manner, together with the required number of hours in Chemistry and Physics, are granted certificates admitting them to the second year's class in many medical schools.

Course VIII. Sanitary Biology.—This is required two periods per week for the Civil Engineers and Chemists in the third term of the Junior year. By means of the Sedgewick-Rafter apparatus and microscopes a practical study of the organisms affecting water supplies is made. The relation of bacteria to disease, the presence and significance of bacteria in water and milk, and the quantitative and qualitative analysis of spring, well and river waters are the chief subjects investigated. A laboratory well equipped with sterilizers, incubators, Pasteur dishes, Sedgewick-Rafter apparatus and microscopes magnifying from 50 to 1000 diameters enables the students to carry on much practical work.

GEOLOGY.

Professor Peck.

This branch of natural science is offered as an elective at the beginning of the Junior year to students pursuing



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the Classical, Latin Scientific, and General Scientific courses, and may be continued to the end of the Senior year.

The course is continuous and each term's work depends upon that which has preceded. It is desirable that students electing this subject should do so for at least two terms and that they should be familiar with the elements of Physics, Chemistry, and Biology. For the work of the Senior year, a knowledge of these subjects is required.

JUNIOR YEAR.

The work of the Junior year begins the first term, with a course of 2 periods per week, covering Dynamical, Structural and Physiographical Geology (Course VI). Instruction is given in part by text-book and in part by lectures illustrated by stereopticon views, two thousand of which are in the possession of the Department. Frequent excursions are made into the region about Easton, which abounds in examples illustrating both structure and physiography.

The work of the first term is followed in the second by a course of two periods per week in Historical Geology (Course VII). The first part of the term is devoted to a study of the stratigraphic sequence of rocks as exhibited in the geology of the eastern part of the State of Pennsylvania and of New Jersey, together with such general discussions of the character, distribution, and fossil contents of the same formations found elsewhere as time will permit. The latter part of the term is devoted to a somewhat detailed discussion of the principles underlying the classification of fossil forms (Course X), particularly the invertebrates, and to a study of the fossils themselves,

an excellent working collection of which is placed at the disposal of the students.

During the third term a course of two periods per week in Crystallography is given (Course I).

SENIOR YEAR.

ADVANCED WORK IN GEOLOGY, CRYSTALLOGRAPHY AND PETROGRAPHY.

The work of the Senior year is open only to those who have pursued the courses offered in the Junior year, and is intended for those desirous of securing a more thorough grounding in crystallography, petrography and geology preparatory to teaching them, or for any who may be looking forward to geology as a profession, and therefore to post-graduate work in a university.

The work is accomplished in two-hour courses extending through the year, and begins in the first term with an introduction to methods of practical field work in geology (Course IX).

The second term is devoted in part to advanced work in crystallography (Course II) and consists also in part of an introductory course in petrography (Course III).

The student then should be prepared to undertake during the third term some problem in field work which will enable him to complete Courses III and IV, and at the same time give him an opportunity to apply his knowledge.

REVIEW OF THE WORK IN THE DEPARTMENT OF GEOLOGY AND MINERALOGY BY COURSES.

Course I. Elementary Crystallography.—Two periods per week. Text book, "Elements of Crystallography,"

Williams. Two periods each week are devoted to a study of well crystallized mineral specimens, attended by instruction in determining crystal forms, and by practice in redetermining them. Considerable time is devoted to a study of the physical, chemical and geometrical properties of crystalline substances, to the drawing and measurement of crystals, contact goniometers being employed for the latter.

Course II. Advanced Crystallography.—Two periods per week. Lectures on the optical properties of minerals, including laboratory practice in determining their optical constants in orientated thin sections under the microscope with the use of polarized light. Also instruction in the use of the Reflecting Goniometer, with practice in calculating the geometrical constants of crystals.

Course III. Petrography.—Two periods per week, Text-book, "Handbook of Rocks," Kemp. Lectures on the classification of igneous rocks. A microscopic study of hand specimens of all the chief varieties of rocks, igneous, metamorphic and sedimentary.

Course IV. Advanced Petrography.—Two periods per week second term Junior year. This course is essentially a laboratory course, intended to teach the student the use of the petrographical microscope, and to instruct him in the determination of rocks by means of thin sections, by means of microchemical reactions, and by a separation and determination of the individual mineral constituents of a rock by other methods, *e. g.*, heavy solutions. The course is intended to give the student a more intimate knowledge of the igneous and metamorphic rocks, and is supplemented by lectures. Books of reference, "Petrology for Students," Harker. "Rock

Minerals," Iddings; Iddings's translation of "Physiographie der Massigen Gesteine," Rosenbusch.

Course V. Systematic Mineralogy.—Three periods per week third term Junior year. This course consists of two lectures per week on the classification of minerals, their mode of occurrence (Paragenesis), and the uses to which they are put (Economic Mineralogy), and is supplemented by a course in Determinative Mineralogy, in which the student is required to determine fifty species of minerals and to describe them accurately on printed forms, the means for determination being their physical properties and the blowpipe. A study of several thousand specimens of the more common varieties of minerals is placed at the disposal of the student.

Course VI. General Geology.—Two periods per week first term Senior year. Text-book, "Elements of Geology," LeConte. The course in General Geology extends over two terms. The first term is devoted to Dynamical, Structural Physiographical Geology, and is supplemented by excursions into the field, and by a limited amount of individual field work, which is intended to introduce the student to practical methods of geological investigation. He is required to hand in at the end of the term a properly constructed section ten miles long.

Course VII. General Geology.—Two periods per week second term Senior year. Text-book, "Elements of Geology," LeConte. This course is a continuation of Course VI, and completes the subject of General Geology. The time is devoted to a consideration of Historical Geology, as much emphasis as time will permit being placed on those accumulations, organic and inorganic,

which are of economic importance. The department of Geology is well equipped with study collections of rocks and fossils, and possesses an excellent stereopticon with numerous slides illustrating every phase of the subject; also numerous maps, charts and models.

Course VIII. Economic Geology.—Two periods per week. In this Course instruction is given in part by lectures and in part by the assignment of reading in the following works: "Economic Geology of The United States," Ries; "Ore Deposits of the United States and Canada," Kemp; "The Nature of Ore Deposits," Beck, translation by Weed; "Genesis of Ore Deposits," American Institute of Mining Engineers. The numerous monographs, folios and bulletins of the United States Geological Survey are also constantly in use. This course is devoted exclusively to the geology of the metalliferous deposits.

Course IX. Advanced Field Work.—Two periods (afternoons) per week. Students taking this Course are required to make a detailed study of an area, and to hand in at the end of the term a colored map showing the surface geology of that area, and at least one section showing its structure. The map and sections must be accompanied by a written description of the geology of the region, together with appropriate hand specimens of the different kinds of rock properly labeled. Where necessary, thin sections must be cut, and the rock determined microscopically.

Course X. Palaeontology.—Ten lectures. At present this Course is given in connection with Course VII, as a part of the last term's work in General Geology as pursued by students of the Classical, Latin Scientific and

General Scientific Courses. In this brief time a somewhat detailed description of invertebrate fossil forms is attempted, based on their zoological relationships. Von Zittle's classification is followed.

SYNOPSIS.

CLASSICAL COURSE.

FRESHMAN YEAR.

First Term.

	Hours.
ALGEBRA.—A brief review of the requirements of admission and a continuation of the study of equations.....	4
GREEK.—Xenophon: Memorabilia; prose composition; classical geography.....	4
LATIN.—Livy: Books I and XXI; Latin Prose; Early Roman History, and the second Punic War.....	4
ENGLISH.—English Composition.....	2
HYGIENE.—Lectures upon the Essentials of Health.....	1
THE BIBLE.—The Bible in English and Coleman's Geography of the Bible.....	1

Second Term.

ALGEBRA AND GEOMETRY.—Plane and Solid.....	4
GREEK.—Herodotus: Select passages; old Greek life.....	4
LATIN.—Horace: Odes; Prosody: Latin Prose.....	4
ENGLISH.—English Composition.....	2
ELOCUTION.....	1
THE BIBLE —The Bible in English.....	1

Third Term.

ALGEBRA completed, Solid Geometry completed, Division B. Geometry, Trigonometry, Division A.....	4
GREEK.—Homer: The Iliad; select passages from the first six books; Greek literature.....	4
LATIN.—Horace: Satires and Epistles; Roman Antiquities. Throughout the year a review of Syntax and Etymology; exercises in written translation.....	4
ENGLISH.—English Composition.....	2
ELOCUTION.....	1

Hours.

THE BIBLE.—The Bible in English.....	1
Declamations, Themes, and Forensics throughout the year.	

SOPHOMORE YEAR

First Term.

Plane and Spherical Trigonometry, Mensuration, and Plane Analytical Geometry, Division A. Trigonometry, Division B.....	4
GREEK.—Homer: The Iliad; select passages from Books XVIII to XXIV; Homer and the Bible compared.....	4
LATIN.—Cicero: DeOratore; the subjunctive mood; Roman History from the Gracchi to the Empire.....	4
ENGLISH.—Trench on Words.....	2
FRENCH.—French I.....	2
ELOCUTION.....	1
THE BIBLE.—The Greek Testament.....	1
Declamations, Themes, and Forensics.	

Second Term.

Plane Analytical Geometry, Division B. Plane and Solid Analytical Geometry, Division A.....	4
GREEK.—Plato: The Apology and Crito; select passages..	4
LATIN.—Christian Latin: Latin Hymns and De Senectute; formation of words; early Roman literature.....	4
ENGLISH.—Anglo-Saxon.....	2
FRENCH.—French Ia.....	2
ELOCUTION.....	1
THE BIBLE.—The Greek Testament.....	1

Third Term.

PHYSICS.—Elementary Mechanics.....	4
GREEK.—Aeschines against Ctesiphon.....	4
LATIN.—Cicero: DeOfficiis; Topics in the History of Philosophy.....	2
FRENCH.—French Ib.....	2
GERMAN.—German I.....	2
CHEMISTRY.....	2
ELOCUTION.....	1
THE BIBLE.—The Greek Testament.....	1
Declamations, Themes and Forensics throughout the year.	

JUNIOR YEAR.

First Term.

	Hours.
PHYSICS.—Heat, Magnetism and Electricity.....	4
GERMAN.—German 2.....	3
THE BIBLE.—The Epistle to the Romans in Greek.....	1

ELECTIVES.

One subject to be chosen from each group.

MATHEMATICS.—Calculus.	}	4
GREEK.—Demosthenes.			
GEOLOGY.—VI			
ENGLISH.—Bacon.			
CHEMISTRY.—Lectures and Laboratory Work.	}	2
BIOLOGY.—Botany.			
FRENCH.—French II.			
HISTORY.—English History.			
LATIN.—Tacitus; Agricola; Roman Literature of the Silver Age.	}	2
BIOLOGY.—Mammalian Anatomy.			

Second Term.

PHYSICS.—Acoustics, Optics.....	4
PHILOSOPHY I.....	3
THE BIBLE.—The Epistles to the Romans in Greek.....	1

ELECTIVES.

One subject to be chosen from each group.

ENGLISH.—Milton.....	}	.....	4
MATHEMATICS.—Calculus.....			
(If neither of the above subjects is chosen, one subject must be taken from each of the following groups:			
GEOLOGY. —VII and X.	}	.....	2
GREEK.			
GERMAN.—German 3 and 4.....	}	.....	2
HISTORY.—Colonial History of the United States			

	Hours.
CHEMISTRY	} 2
BOTANY (Advanced)	
HISTORY.—English History	
FRENCH.—French IIa	
LATIN.—The Drama	} 2
BIOLOGY.—Vertebrate Zoology	

Third Term.

HISTORY.—Constitutional History of the United States	2
PHILOSOPHY II	2
PHILOSOPHY I	3
THE BIBLE.—The Epistles to the Romans in Greek	1

ELECTIVES.

One subject to be chosen from each group.

ENGLISH.—Shakespeare	} 4
MATHEMATICS.—Calculus	
GEOLOGY.—Crystallography I. }	} 4
GREEK. }	
GERMAN.—German 3 and 4. }	
HISTORY.—American History. }	
CHEMISTRY	} 2
BIOLOGY.—General Biology	
FRENCH.—French IIb	
LATIN, JUVENAL.—Roman Archaeology	} 2
BIOLOGY.—General Biology	

Declamations, Themes and Forensics throughout the year.

SENIOR YEAR.

First Term.

ASTRONOMY	4
PHILOSOPHY, III	3
CHURCH HISTORY.—Conflict of Christianity and Heathenism	1

ELECTIVES.

One subject to be chosen from each group.

			Hours.
ENGLISH.—English Romantic Poets.	}		
(If English is not chosen one subject must be taken from each of the following sub-groups.)			
HISTORY.—General Constitutional History.		} . 2	} 4
PHILOSOPHY, V.			
CHEMISTRY.			
INTERNATIONAL LAW.		} 2	
MATHEMATICS.—Differential Equations			
GERMAN.—German 11-13 or 14-16.			
BIOLOGY.			
ENGLISH.—Shakespeare.			
(If neither of the above subjects is chosen, one subject must be taken from each of the following sub-groups.)		} 4	
GREEK.	} 2		
FRENCH.—French III or IV.			
GEOLOGY, IX.	} 2		
LATIN.—Lucretius.			

Second Term.

PHILOSOPHY, IV	3
POLITICAL ECONOMY	2
CHURCH HISTORY.—Conflict of Christianity and Heathenism	1

ELECTIVES.

One subject to be chosen from each group.

HISTORY.—Constitutional History of the United States.	} 2	
MATHEMATICS.—Theory of Functions.		
GERMAN.—German 11-13 or 14-16.		
GEOLOGY.—Crystallography II and Petrography III		
ENGLISH.—English Fiction.	} 4	
BIOLOGY.—Physiology.		
(If neither English nor Biology is chosen one subject must be taken from each of the following sub-groups.)		
GREEK.		
FRENCH.—French IIIa or IV.	} 2	
LATIN.—Inscriptions		
HEBREW.		

Hours.

ENGLISH.—English Romantic Poets.

(If English is not chosen one subject must be taken from each of the following sub-groups.)

BLACKSTONE.	}	..... 2	}	..... 4
CHEMISTRY.				
ASTRONOMY.	}	..... 2	}	
HISTORY.—General Constitutional History.				
PHILOSOPHY, V.				

Third Term.

PHILOSOPHY, IV.....	2
PHILOLOGY.....	3
THE BIBLE.—History of the English Bible.....	1

ELECTIVES.

One subject to be chosen from each group.

HISTORY.—Constitutional History of the United States.	}	... 2
MATHEMATICS.—Theory of Functions.		
GERMAN.—German 11-13 or 14-16.		
GEOLOGY.—Petrography III and IV.		

ENGLISH.—English Literature.

BIOLOGY.—Physiology.

(If neither English nor Biology is chosen one subject must be taken from each of the following sub-groups.)

GREEK.	}	..... 2	}	..... 4
FRENCH.—French IIIa or IV.				
LATIN	}	..... 2	}	
HEBREW.				

ENGLISH.—English Romantic Poets.

(If English is not chosen one subject must be taken from each of the following sub-groups.)

BLACKSTONE.	}	..... 2	}	..... 4
CHEMISTRY.				
ASTRONOMY.	}	..... 2	}	
HISTORY.—General Constitutional History.				
POLITICAL ECONOMY.				
PHILOSOPHY, V.				

PARDEE SCIENTIFIC DEPARTMENT.

This Department was organized in 1866, in accordance with the conditions of a gift from Ario Pardee, Esq., of Hazleton, Pa. The original organization has been from time to time greatly enlarged and extended, largely through the continued munificence of the founder. There are at present two General Courses of Study, Latin Scientific and the General Scientific, and four technical courses.

LATIN SCIENTIFIC COURSE.

This course, which leads to the Degree of Bachelor of Philosophy, was designed to meet the wishes of those who desire to pursue a course of liberal study, but will not study Greek. It therefore is the same as the Classical Course except that the time devoted to the study of Greek in that course is given to the pursuit of studies mainly of a scientific character, but throughout the general course of this school great importance is paid to the study of the English language under the special direction of Professor Francis A. March, Jr. In the Freshman year the substitutes for Greek are German and English Language and Composition, while in the Sophomore they are various English studies. In the third term, Sophomore year French is begun and continued through the first and second term of the Junior year. The method of instruction in each Department is fully dealt with under the course of study in the General Scientific Course. The synopsis which follows will sufficiently explain any other peculiarities of the Course.

SYNOPSIS.

LATIN SCIENTIFIC COURSE

The course of study is the same as the Classical Course except as follows:

FRESHMAN YEAR.

German (German 5-6) is substituted for Greek, four hours a week being given to this subject during the three terms.

SOPHOMORE YEAR.

First and Second Terms.

The Bible is read in Latin instead of Greek. English and German are substituted for Greek, two hours a week being given to each. The English study for the First Term is Bunyan and for the Second Term, Spenser.

Third Term.

The Bible is read in Latin instead of Greek. English (Chaucer) is substituted for Greek.

JUNIOR YEAR.

First Term.

The Bible is read in Latin instead of Greek. English History is substituted for German.

After First Term. Junior year, the schedule for the Latin Scientific Course is the same as the Classical, except that during the Second and Third Term, Junior year, the Bible is read in Latin instead of Greek.

(For schedule of study of the Classical Course see pages 54-59)

GENERAL SCIENTIFIC COURSE.

This course leads to the degree of Bachelor of Science, and consists of a curriculum in which Mathematics, the Modern Languages and their Literatures, especially English, and the Natural and Physical Sciences receive principal attention. It includes, however, the more general studies of the Arts Course, such as History, Logic and Rhetoric, Mental and Moral Philosophy.

The Mathematics of this course is the same as the Mathematics of the technical courses, or the Latin Scientific Course, as the student may elect upon entrance. Students electing the mathematics of the technical course may not change unless free from conditions. French and German are begun in the Freshman year and are pursued with great breadth and particularity. The student's attention is directed to the study of the literatures of these languages in the endeavor to supply, so far as may be possible, the liberal culture ordinarily to be obtained only by the classical studies, but particular stress is laid upon the very thorough-going course in English, a description of which follows:

ENGLISH LANGUAGE AND LITERATURE.

Professors Francis A. March (Prof. Emeritus), F. A. March, Jr., J. W. Tupper and Mr. Farquhar.

In the Freshman Class there is, first of all, a thorough course in English composition. The theory is taught in lectures and recitations, and the practice obtained in daily themes, in longer fortnightly themes, and in frequent consultation between the student and the instructor. Then before the more advanced work in Philology is undertaken, other languages are studied. French and German (as in the Classical Course Latin and Greek) come in as parts of the organized scheme of linguistic study, and are so pursued as to become a means of special culture in English. The following is the program of the Freshman long theme and prescribed reading for 1907-'08.

1907-08—*First Term.*

LONG THEMES.

Subject.	When Due.
I. Who I am and why I came to Lafayette (500-1000 words).....	Sept. 30
II. How to make or do something (500-1000 words).....	Oct. 14

Subject.	When Due.
III. An exposition on a subject selected with the approval of the instructor (500-1000 words)...	Oct. 28
IV. An expression of opinion (500-1000 words).....	Nov. 11
V. A biographical portrait (1000-2000 words).....	Nov. 25

OUTSIDE READING.

General. Shakespere, *As You Like It*; *Henry IV, Part I*; *Othello*.
 Sept. 12-Oct. 12. Macaulay, *History of England*, Chapter iii.
 Oct. 14-Nov. 9. L. B. R. Briggs, *School, College, and Character*.
 Nov. 11-Dec. 14. Macaulay, *Essay on Boswell's "Life of Johnson"*
 Stevenson, *Thoreau* in "Familiar Studies of Men and Books" Green,
A Short History of the English People, Part III, Chapter vii, Section 3, "Elizabeth."

1907-08—Second and Third Terms.

LONG THEMES.

Subject.	When Due.
VI. Brief of introduction to argument.....	Jan. 20
VII. Brief of Argument (2 to 3 pages).....	Feb. 3
VIII. Argument (1000-1500 words).....	Feb. 17
IX. Description (500-1000 words).....	Apr. 13
X. Narrative (500-750 words).....	Apr. 27
XI. Narrative (750-1500 words).....	May 11

OUTSIDE READING.

General. Second term: Tennyson, *Geraint and Enid*, *Lancelot and Elaine*, *Guinevere*, *The Passing of Arthur*. Third term: Hawthorne, *The Scarlet Letter*.

January. *Specimens of Argumentation*, ed. G. P. Baker.

February. Lincoln, *Letters and Speeches* (Little Masterpieces series, ed. Bliss Perry).

April. Stevenson, "A Night Among the Pines," from *Travels with a Donkey*; Kipling, *The Spring Running*; Ruskin, *Selections* ("Little Masterpieces" series), pp. 1-100.

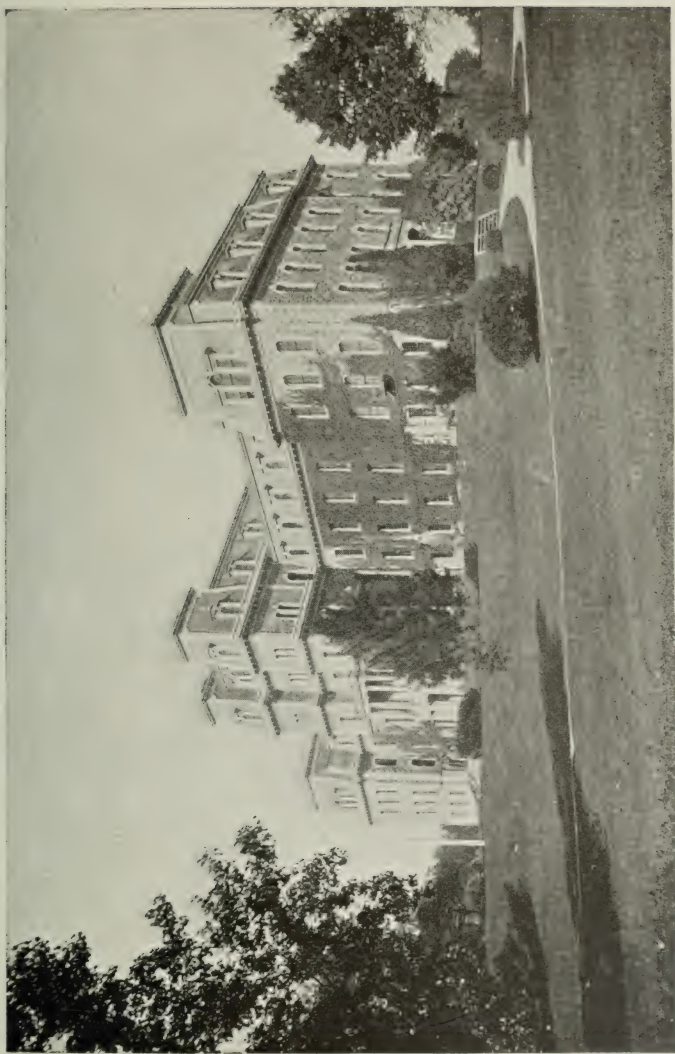
May. Kipling, *The Man Who would be King*, *Without Benefit of Clergy*; *The Drums of the Fore and Aft*; Poe, *The Cask of Amontillado*, *The Gold Bug*; Stevenson, *The Merry Men*, *A Lodging for the Night*.

The text-book used during the entire course is Gardiner, Kittredge, and Arnold's *Manual of Composition and Rhetoric*. Nutter, Hersey and Greenough's *Specimens of Prose Composition* furnishes the materials for the study in the class-room of exposition in the first

term, Argumentation in the second term, and Description and Narration in the third term.

Sophomores take up in the first term Trench on the Study of Words and Bunyan's Pilgrim's Progress, in connection with which English Grammar is studied. The Grammar subjects for this term are Syntax, Grammatical Equivalents, Rhetorical Forms, and Historical Elements. On each, daily recitations are heard, and the lessons learned are constantly illustrated by the text under review. The whole story of Pilgrim's Progress is read, the allegorical meaning called for part by part, and salient doctrinal points noticed.

The staple of daily drill, however, is found in connection with the minute and careful treatment of selected passages. These are studied clause by clause and word by word. The Syntax is first made clear, then words are taken up; synonyms and phrases grammatically equivalent are brought into comparison, and the student is taught to feel an intelligent preference for one or another form of expression, as it may promote perspicuity, liveliness, or other traits of a clear and vigorous style. In the treatment of single words, also, the German and French are called for, and as far as practicable in the Scientific Course the Latin. The laws of change, the derivation, the root, the radical idea, kindred words, the primary meaning, changes in the meaning with the connection of thought, together with such other lines of inquiry as are suggested by Trench, as indications of history, character, moral suggestions, and the like; poetical forms of frequent occurrence are also specially noted, and the collocation of words discussed, both with respect to syntax and the rhythmical cadences of speech.



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In connection with this daily drill, the life and times of Bunyan are discussed in writing by each member of the class, and his diction compared with that of other standard works, and especially with the Bible. In this part of the work students are directed by questions and references, but are expected to look up information everywhere.

This system of daily drill on the best passages, reports on other readings, and weekly essays on topics growing out of the discussions of the life and times of the author, is found to lead the student on by sure and rapid steps to an intelligent appreciation of the author's works, his place in literature, and on the whole to the best mastery of his genius.

The same general plan is pursued progressively through the course, with changes from term to term, in the topics embraced in the drill.

The Sophomores (second term) read Spenser's *Faerie Queene*, with the same concentration upon representative passages, the special drill topics being derivation, romance of chivalry, and Spenserian stanza. During the term, two hours each week are given to the study of Anglo-Saxon. In the third term Chaucer (*Canterbury Tales*) is the basis of work. Several of the tales are read and discussed, but the famous Prologue is the special subject of study and philological drill. All the results of previous works are kept constantly in review. This is an emphatic feature of the method. "A line of questions once begun is always kept up." The special drill topics this term are Phonetic Elements, Orthographic Elements, a review of Historical Elements, and Criticism of Uncertain Text. During the Junior and the Senior years the courses in English are elective.

The Juniors (first term) take for philological study selected essays of Bacon; they prepare reports and criticisms of others of his works, and of his character, life, and times, in weekly written papers. During the second term they read Milton's *Paradise Lost*. The philological study is mainly directed to the deduction of English words and forms from Anglo-Saxon. The paradigms and the text read are examined word by word in this view. Special objective points are Poetical Forms and Epic Art. In the third term Shakespeare's play of *Julius Caesar* is read. The philological study is used mainly to clear up, enrich, and impress the thoughts of Shakespeare. The characters and the structure of the play are studied. Weekly written papers are required from each student upon selected topics connected with Shakespeare's life and times, his genius, his dramatic art and the like.

In the Senior year the first term is given to courses in Shakespeare, and in the English Romantic poets. In the second term the course in English Romantic poets is continued, and a course in English Novels given. In connection with the latter course a representative work of a representative author, selected by the professor, is studied with a view to more extended researches in philology and criticism, and to one elaborate essay by each member of the class, to be handed in at the close of the term. What is known as the F. A. March Prize is awarded on the basis of this term's work. During the third term, Senior year, Professor Whitney's *Lectures on Language* are studied. The work of the entire course in Comparative Philology is reviewed and co-ordinated, and advanced work in English literature pursued by means of lectures and class discussions.

HISTORY.

The President and Professor Roberts.

All the courses in History and Political Science described under the Classical Course are also open to students of this Department.

SYNOPSIS.

GENERAL SCIENTIFIC COURSE.

FRESHMAN YEAR.

First Term.

	Hours.
ALGEBRA.....	4
ENGLISH.—English Composition.....	2
CHEMISTRY.—Lecture and Laboratory Work.....	4
DRAWING.—Industrial Drawing.....	2
GERMAN, 8-10.....	2
FRENCH.....	2
HYGIENE.—Lectures.....	1
THE BIBLE.—The Bible in English.....	1

Second Term.

TRIGONOMETRY AND MENSURATION OR ALGEBRA AND GEOMETRY.....	5
ENGLISH.—English Composition.....	2
CHEMISTRY.—Lecture and Laboratory Work.....	2
GERMAN, 8-10.....	2
FRENCH.....	2
DRAWING.....	2
THE BIBLE.—The Bible in English.....	1

Third Term.

ALGEBRA AND GEOMETRY, 4 hours, OR TRIGONOMETRY AND MENSURATION AND ANALYTICAL GEOMETRY.....	5
ENGLISH.—English Composition.....	2
CHEMISTRY.—Elementary Organic Chemistry.....	2
FRENCH.....	2
GERMAN, 8-10.....	2

	Hours.
DRAWING.—Projections.....	2
THE BIBLE.—The Bible in English.....	1

SOPHOMORE YEAR.

First Term.

GEOMETRY OR TRIGONOMETRY AND MENSURATION.....	3
DIFFERENTIAL CALCULUS OR GEOLOGY.....	2
GEOLOGY.....	2
ENGLISH.—Trench on Words 2. Bunyan 2.....	4
GERMAN, 11-12-13.....	2
FRENCH.....	2
CHEMISTRY.—Analytical Chemistry.....	2
THE BIBLE.—The Bible in French.....	1

Second Term.

ANALYTICAL GEOMETRY.....	4
DESCRIPTIVE GEOMETRY OR GEOLOGY.....	3
ENGLISH.—Anglo-Saxon 2, Spenser 2.....	4
ENGLISH.—Spenser.....	2
CHEMISTRY.....	2
GERMAN, 11-12-13 OR FRENCH.....	3
THE BIBLE.—The Bible in French.....	1

Third Term.

PHYSICS.—Elementary Mechanics.....	4
ENGLISH.—Chaucer.....	4
BIOLOGY.—Sanitary Biology.....	4
CHEMISTRY.—Analytical Chemistry.....	2
THE BIBLE.—The Bible in French.....	1

JUNIOR YEAR.

First Term.

PHYSICS.—Heat, Magnetism and Electricity.....	4
HISTORY.—English History.....	2
ELOCUTION.....	1
THE BIBLE.—The Bible in German.....	1

ELECTIVES.

One subject to be chosen from each group.

	Hours.
GEOLOGY, VI. }	4
ENGLISH.—Bacon. }	
CHEMISTRY. }	
BIOLOGY.—Botany. }	2
FRENCH. }	
BIOLOGY.—Mammalian Anatomy. }	
GERMAN. }	2

After the First Term, Junior year, the schedule of study for the General Scientific Course is the same as the Classical Course except that during the rest of the Junior year the Bible is read in German instead of Greek. (For schedule of study of the Classical Course see pages 54-59.)

DEPARTMENTS OF ENGINEERING.

There are at present embraced in the curriculum three courses in ENGINEERING: Those of Civil, Mining, and Electrical Engineering. The location of the College is peculiarly favorable for such engineering schools. The city of Easton is a centre of railroads and canals, while bridges, foundries, pipe works for water and gas, cement works, rolling mills, repair shops, and many other industrial works are near at hand. Mines of iron, anthracite coal, and zinc are easily accessible, and extensive quarries of limestone, steatite, and slate are to be found in the immediate vicinity, and afford excellent opportunities for the study of mining operations. The demand, created by the great number of mechanical works in connection with these natural conditions and their development, for specially trained chemists has led to the establishment of a special course in CHEMISTRY.

COURSE OF INSTRUCTION.

The instruction in all the engineering courses is substantially the same during the first two years of the course, except that the electrical engineers substitute the study of physics and practical work in the physical laboratory for a part of the surveying, field, and office work of the other courses.

MATHEMATICS.

Professor Hall and Messrs. Brasefield, Little, Colliton and Marquard.

The aim in the Technical Mathematics is not only to

secure readiness and accuracy in demonstrating propositions, but also in solving practical problems. While the value of the study of Mathematics as mental discipline will not be overlooked, the object is always to give the student that working knowledge of the subject that will enable him to apply accurately and readily, mathematical principles to the solution of engineering problems. It is regarded as absolutely essential that an engineering student be thoroughly grounded in the mathematical principles and operations that are applied in the engineering branches.

It is strongly recommended that algebra be thoroughly reviewed just before admission to college.

Algebra.—Binomial theorem, theory of logarithms, probability, variables and limits, series and theory of equations. Text-book, Wentworth's College Algebra. First term, Freshman year, 4 periods per week.

Trigonometry.—The work in this course begins with a rapid review of the elementary Plane Trigonometry. Then follows the advanced Plane Trigonometry, consisting of derivation of formulas and trigonometrical series, solution of right and oblique-angled triangles and solution of problems involving the practical applications. About one-third of the time is devoted to Solid Trigonometry which is also completed. Text-book, Crawley's Trigonometry. Second term, Freshman year, 5 periods per week.

Analytic Geometry.—The work in this subject consists of the Analytic Geometry of two dimensions, including the point, right line and circle, the conics, tangents, diameters, transformation of coördinates, the general equation of the second degree and higher plane

curves; also the Analytic Geometry of three dimensions, including the point, the plane and surfaces of revolution. Text-book, Ashton's Analytic Geometry. Third term, Freshman year, 3 periods per week and first term, Sophomore year, 3 periods per week.

Mensuration and Logarithms.—The work includes the mensuration of the ordinary geometrical magnitudes, conic sections and curved surfaces and solids. The prismoidal formula, Simpson's rule, etc., are given. Much practice is given in logarithmic computations in problems relating to Physics, Mechanics and Engineering. Text-book, Hall's Mensuration. Third term, Freshman year, 2 periods per week.

Calculus.—The work in the Differential Calculus consists of the differentiation of all the functions of one or more variables, successive differentiation, implicit functions, development of functions, evaluation of indeterminate forms, maxima and minima, properties of curves and radius of curvature, together with numerous practical applications in Mechanics. In the Integral Calculus are treated the integration of rational, irrational and transcendental functions, integration by parts and successive integration, rectification of curves, quadrature of plane surfaces, surfaces and volumes of solids, centers of gravity of lines, surfaces and solids and moments of inertia. Text-book, Hall's Differential and Integral Calculus. First term, Sophomore year, 5 periods per week.

Least Squares.—Law of probability of error, adjustment of observations and empirical formulas. The problems are selected with particular attention to the needs of the engineers. Text-book, Merriman's Least Squares. Third term, Sophomore year, 3 periods per week.

Differential Equations.—In this subject are given the principal differential equations of the first order and degree and those of the second order that are of importance in the applied mathematics that follow. Text-book, Hall's *Differential and Integral Calculus*. Third term, Sophomore year, 2 periods per week.

ASTRONOMY.

Prof. Hardy and Mr. Smith.

First term, Senior year. General Astronomy, Young's "General Astronomy," 2 hours per week. This course includes a thorough study of points and lines of celestial sphere; a discussion of parallax, refraction, precession, nutation and of methods of determining time, latitude and longitude; a study of earth as a member of solar system; of moon; of sun, including spectroscopy of sun; of eclipses; of planets and their satellites; of general structure of stellar universe; and a discussion of the cosmogony and the Nebular Hypothesis.

Second term, Senior year. Practical Astronomy, Campbell's "Elements of Practical Astronomy," two hours per week, exclusive of work in Observatory and Field. The students are made familiar with construction and use of an Ephemeris; with construction and adjustment of sextant, transit instrument and Zenith Telescope; with the solution of the astronomical triangle, and the mathematics involved in computing time by singles and equal altitudes, and by the transit instrument and latitude by means of single altitude of star, by circumpolar stars; and by Zenith Telescope. Observations are made and results computed for determining index correction of sextant, and time by single altitude of sun.

Third term, Senior year. Practical Astronomy, Campbell's "Elements of Practical Astronomy," two hours per week, exclusive of work in Observatory and Field. Observations are made and results computed for determining time by equal altitudes of sun, by single altitude of star and by means of Transit Instrument; latitude by single altitude of star, by circumpolar star and Zenith Telescope.

GRAPHICS.

Professor Hall and Messrs. Brasefield, Colliton and Marquard.

The regular course in drawing covers the first two years. The Freshman year's work is elementary and in the Sophomore year is given an advanced course. The work of each term includes recitations, lectures and drawing-room exercises. Neatness and accuracy are required. Particular attention is given to lettering and the use of scales. Six distinct sets of drawings are completed in the two years.

Lettering and Drawing.—The use and testing of drawing instruments and materials, construction of plane geometrical problems, pen and brush shading and tinting, engineering conventions, working drawings with tracings and blue-prints, orthographic, isometric and clinographic projections, copying from models, sketching, shades and shadows and freehand lettering. Text-books, Fannce's Elements of Mechanical Drawing and Reinhardt's Lettering. Three terms, Freshman year, 2 periods per week.

Descriptive Geometry.—In Descriptive Geometry the subjects as treated in order are the point, line, plane,

single curved surfaces, double curved surfaces, warped surfaces, intersections, developments, perspective, graphical solutions of spherical triangles and many problems showing the graphical solutions of problems in Machine Drawing, Architecture, Surveying, etc., are given. Text-book, Hall's Descriptive Geometry. First and second terms, Sophomore year, 2 periods per week.

Machine Drawing.—Detailed working drawings with tracings and blue-prints of screws, joints, gear-wheels, engine parts, etc., are made. The object is to qualify the students to read working drawings readily and to construct them according to approved practice and to be able to apply the elements of Machine Design. Text-book, Rippers' 'Machine Design. Third term, Sophomore year, 2 periods per week.

MINERALOGY AND GEOLOGY.

Professor Peck.

Students in the Technical courses begin work in this Department the first term Junior and complete it the second term Senior year, with the exception of the students in Electrical Engineering who take but one term, *viz.*, the first term of Junior year; and with the exception also of the students in Mining Engineering, who continue through the third term of Senior year, taking two periods per week in field work and in addition two periods per week in Mining Geology.

JUNIOR YEAR.

During the first term of this year two periods per week are devoted to a study of crystal forms in which Williams' Elements of Crystallography is followed (Course I).¹ The course is abundantly illustrated with glass and

¹ For description of courses see pages 50-54.

wooden models, and each alternate exercise consists of a practicum at which well-crystallized minerals are studied, and their properties discussed. The latter part of the term is devoted to a brief discussion of the optics of crystals.

The second term's work consists in a brief course in Lithology during which Kemp's Handbook of Rocks is used as a text-book (Course III). A minimum course is required of the students in the Civil Engineering and Chemical courses, while for the Mining Engineers a more detailed discussion of the principles underlying the classification of rocks, more particularly the igneous varieties, is attempted, this work being supplemented by a careful study both macroscopic and microscopic, of the leading varieties. For this purpose five hundred hand specimens with their corresponding thin sections are available.

The third term's work consists in a systematic review of mineral species, more especial attention being paid to their chemical and crystallographic relations and to their mode of occurrence in nature (Course V). Instruction is given by lectures, which are illustrated by a study collection consisting of some two thousand specimens, including the most important species. A course in determinative mineralogy supplements these lectures. The student is required to determine sixty minerals and to write out a description of each.

SENIOR YEAR.

The study of rocks and minerals in the Junior year is followed in the Senior year by a course in Geology. It is identical in most respects to the introductory course as planned in the Culture courses. The first term is devoted

to Dynamical Structural and Physiographical (Course VI) and the second to Historical Geology (Course VII). During the fall term the work of the class-room is supplemented by excursions into the neighboring region, and sufficient time is devoted to field work to enable each student to construct a six-mile section up and down the Delaware River from Easton.

As previously stated, students in Mining Engineering continue in this department through the third term Senior year. They are required to spend two afternoons per week in the field, in making a detailed study of a given area and to hand in at the end of the term a colored map showing the areal geology and at least one profile section showing the structure of this area. They are also required to collect hand specimens and where necessary to cut thin sections and to make accurate petrographical determinations of the different rocks found within that area. A written description of the geology and petrography of the area must accompany the map, section and hand specimens (Course IX).

In addition to the field work, two periods per week are devoted to a discussion of the geology of ore deposits. (Course VIII). Instruction is given in the form of lectures, which are illustrated by stereopticon views, by specimens of ore and of the country rock in which the ore bodies are found, and by maps and diagrams showing the shape, mode of occurrence and geological relations of the ore bodies. Collateral reading is assigned in Kemp's *Ore Deposits of the United States and Canada*; Weed's translation of Beck's *Nature of Ore Deposits* and in *Genesis of Ore Deposits* published by the American Institute of Mining Engineers. The Monographs, folios and bulletins

of the United States Geological Survey are also constantly in use.

Prominent among the teaching appliances of the department is a large projecting apparatus used in demonstrating the optical properties of minerals, to which there is a microscope attachment for throwing thin rock sections upon the screen; also five reflecting goniometers with horizontal circle; four petrographical microscopes; a polariscope, a mineral dresser, a lathe run by electricity, and all the apparatus for the preparation, mounting, and microscopical study of thin mineral and rock sections.

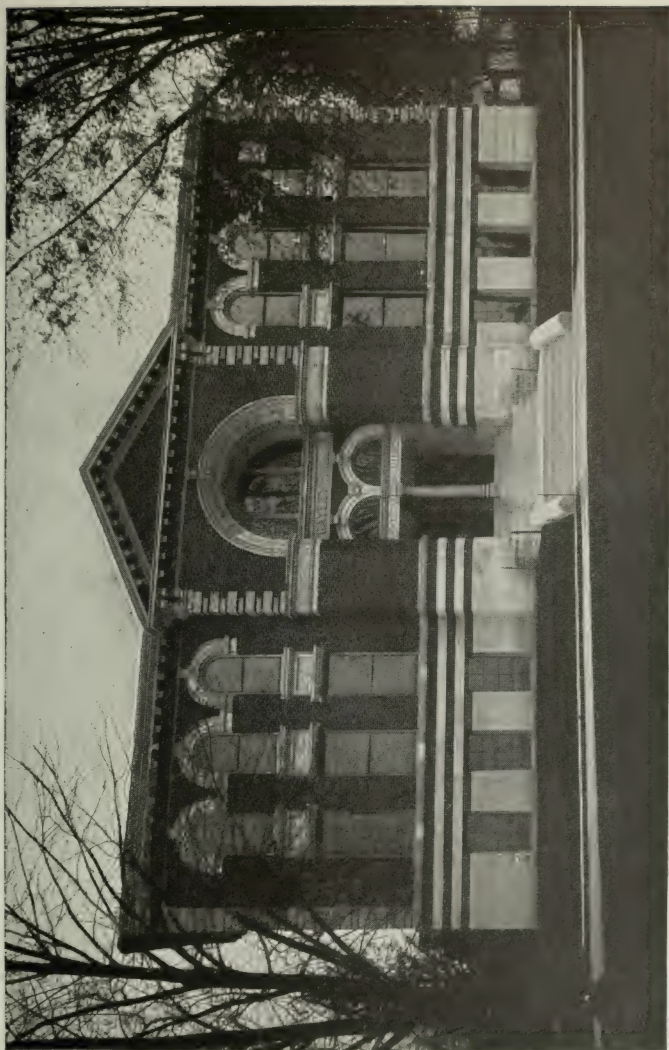
CHEMISTRY.

Professors Hart and Wysor, and Messrs. DeLong and Hess.

The study in this Department begins with a course of lectures in General Chemistry. A text-book is used and daily recitations are held. Each student is required to work in the Laboratory.

In the Mining Engineering and Electrical Engineering courses this course is followed in the Junior and Senior years by courses in qualitative and quantitative analysis. Special attention is given to the analysis of engineering materials. The modern quick methods are thoroughly taught, theoretically and practically.

Partial or special students may enter the laboratories at any time, provided they have the necessary knowledge of General Chemistry to work advantageously. Advanced students will be afforded opportunity for continuing their studies, or for conducting investigations in Organic or Inorganic Chemistry.



GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY.

METALLURGY.

1. *General Metallurgy*.—Properties of metals. Refractory materials. Combustion and thermal measurements. Fuels and their preparation. Furnace types and methods of firing. Ores and ore dressing. Problems involved in metallurgical processes.

2. *Metallurgy of Iron*.—Ores. Properties and effect of impurities. Smelting. Chemistry of the blast furnace process. Burdening the furnace. Theory of the hot blast and fuel economy. Cast iron and iron founding. Wrought iron. Principles of iron puddling. Steel. The cementation, crucible, Bessemer and open hearth processes. Recent advances in open hearth practice. Special steels. Forging and tempering. Specifications and testing.

3. *Metallurgy of Copper, Lead, Zinc, Mercury, Silver, Gold, Tin, Nickel, Aluminum, Manganese and the Rarer Metals*.—

Copper: Ores and their preparation. Reverberatory and blast furnace smelting. Refining. Wet and electrolytic processes.

Lead: Preparation of ores for smelting. Smelting processes. Recovery of fume. Refining and desilverizing.

Zinc: Ores and their preparation. Smelting by the Belgian process.

Mercury: Ores, properties and methods of extraction.

Gold and Silver: Ores and methods of treatment. Extraction by smelting, amalgamating and leaching processes. Refining.

Extraction of aluminum, nickel, tin, manganese and the rarer metals.

4. *Alloys*.—Constitution. Typical alloys and their preparation. Welding. Plating by dipping and electrolytic processes.

5. *Practical Course*.—Refractory properties of clays by furnace tests. Crushing strength, specific gravity and proximate analysis of coal and coke. Technical gas analysis. Calorific power of solid and gaseous fuels. Fusion points of metals and slags. Ore sampling. Microstructure of iron and steel, showing effect of heat treatment.

PHYSICS.

Professor Moore.

The studies in this Department in all the courses at present occupy four recitations or lectures a week, beginning with the third term, Sophomore year, and continuing through the first and second terms of the Junior year.

In Mechanics there is a thorough mathematical discussion, accompanied with lectures and experiments.

In other subjects text-book study is accompanied with illustrative lectures, aided by apparatus which is continually enlarged and improved.

For students of the Technical courses one period a week in laboratory work is required. Experiments in mechanics, sound, heat, electricity, magnetism, and light are performed by the student, thus illustrating and emphasizing the principles of each respective subject.

Third Term.

SOPHOMORES.

Hours.

MECHANICS.—Elementary Mechanics, Composition and Resolution of forces, center of gravity, Simple Machines, etc. 2

	Hours.
PHYSICS.—Experimental Lectures and Recitations, including the Status of Solids, Liquids and Gas.....	4
LABORATORY.....	1 period.

First Term.

JUNIOR.

MECHANICS.—Technical Mechanics with Application of the Calculus, Theory of Equilibrium, Centroids, Moments of Inertia, Solutions of Problems.....	4
PHYSICS.—Experimental Lectures and Recitations on Heat, Magnetism and Electricity.....	4
LABORATORY.....	1 period

Second Term.

JUNIOR.

MECHANICS.—Technical Mechanics, cont., Kinematics and Kinetics.....	4
PHYSICS.—Experimental Lectures and Recitations on Sound and Light.....	4
LABORATORY.....	1 period

Third Term.

JUNIOR.

MACHINERY.—Steam Engine.....	4
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GERMAN AND ROMANCE LANGUAGES.

Professors Hart and Raschen, Messrs. Hopkins and Hunt.

The elementary courses offered in the above-named languages aim chiefly at a good reading knowledge, and at an acquaintance with the literature, life and customs of the continental nations of Europe. The advanced courses, however, comprise the reading of texts that are scientific in character. The various branches of technology are considered in the selection of reading matter so as to enable the student to continue his reading of scientific treatises and foreign journals of technology.

German.

GERMAN E. 1-2. Prescribed for those who offered French for entrance. Third term, two hours; first term three hours. For a detailed description of the course see under German 1-2 (p. 39).

GERMAN E. 3-4-5.—Prescribed for Freshmen. Two hours through the year. A rapid review of the principles of grammar is followed by the reading of selections from modern writers, and the translation of easy scientific texts.

GERMAN E. 6-7. Prescribed for Sophomores. First and second terms, two hours.

Translation of scientific treatises and essays of advanced character.

GERMAN E. 8-9. Prescribed for chemists. Throughout the Junior and Senior years, one hour. Professor Hart. Translation of scientific treatises on organic chemistry.

French.

FRENCH E. 1-2. Prescribed for Freshmen. Second and third terms, two hours.

Aldrich and Fosters foundations of French will constitute the basis of this course in the elements of French grammar and composition. Reading of simple French prose will be taken up from the beginning.

FRENCH E. 3-4. Prescribed for Sophomores. First and second terms two hours.

In connection with the reading of texts from modern standard authors the class will read scientific French in Bowen's Science Reader.

Spanish and Italian.

Courses in the above are offered whenever there is a demand for them on the part of several students. For description of these see page 40.

HISTORY AND POLITICAL ECONOMY.

The Seniors pursue a course in Political Economy for one term (*vide* pages 28 and 30).

ENGLISH.

Professors F. A. March, Jr., and J. W. Tupper.

All students in the engineering courses are given during the Freshman year a thorough course in English composition. The theory is taught in lectures and recitations, and the practice obtained in daily themes, in longer fortnightly themes and in frequent consultation between the student and the instructor.

For the program of the Freshman long themes and prescribed reading for 1907-'08 see page 62. During the first term of the Sophomore year Trench on the Study of Words is taken up, in the hope that the student may be led to realize the importance of care in the use of the words of our mother tongue.

After the Freshman year every student is required to hand in two themes in every term of his college course. These are read in class and criticized as time allows. In this work the instructors in each department take charge of the students in their respective departments, and the students are required to write upon subjects of a technical character, using freely the words and phrases current among experts, in the use of which the instructors are authorities.

RHETORIC AND ELOCUTION.

Prof. F. A. March, Jr.

See p. 30 for the general statement of the work in Elocution and Rhetoric, and p. 139 for the Literary Societies which are strongly recommended to the students of the Engineering Department.

A Thesis is required in all the Technical Departments as a condition of graduation. It must show evidence of

original investigation upon a subject appropriate to the Department and approved by the professor in charge. It must be neatly written upon regulation paper, bound and illustrated with such photographs, drawings, and sketches as may be needed. It will be prepared during the latter part of the Senior year, and an opportunity will be given at the close of the course to read and defend the same before a public audience. These Theses, accompanied by their drawings, photographs, etc., if accepted, become the property of the College, and are deposited in the Libraries of the various Departments.

CIVIL ENGINEERING COURSE.

Professors Porter and Lyle, and Messrs. Brasefield, Little, Colliton and Tudbury.

The design of this course is to furnish such theoretical instruction and engineering practice as will prepare its graduates for immediate usefulness in the field and office and, after a moderate amount of professional experience, enable them to fill positions of trust and importance in their chosen profession.

Instruction is given by means of lectures and recitations, accompanied by a large amount of practice in the field, laboratory and drafting room. Theoretical principles are illustrated and explained by such problems and examples, taken as far as possible from actual engineering practice, as will best serve the purpose. In addition to the regular lectures, occasional ones are given by prominent engineers in active practice, upon their specialties.

During the course visits are made to engineering

structures, mills, etc., in connection with their special study.

FACILITIES FOR INSTRUCTION.

The Department has a large equipment of instruments necessary for the various branches of engineering field practice including tapes, compasses, transits, levels, plane tables, barometers, standard base line tapes and pulling apparatus, sextants, solar attachments, chronometers, floats and current meters. A twelve-inch portable alt-azimuth instrument reading to single seconds by micrometer microscopes, and provided with level for double zenith distances is used for instruction in Geodesy and Practical Field Astronomy. A precision level of the latest design is employed in instruction in precise leveling. The astronomical observatory contains an equatorial telescope, transit, clock, chronograph, meteorological instruments, etc.

For use in the lecture room there are numerous models of the various types of bridges and roof trusses, several complete sets of full weight standard rolled sections, numerous full weight sections of riveted joints, representing bridge and boiler work, hand and power riveting; wall charts, working drawings, photographs, projecting lantern and numerous slides, slide rules and other calculating machines. The Hydraulic lecture room is directly connected with the laboratory, and the equipment of the latter is used for demonstration purposes before the class.

The Department also has a full weight pin-connected highway bridge of fifty feet span and fourteen feet roadway weighing twelve tons, together with all false work and tools necessary to erect the same.

The General Testing Laboratory contains three one-hundred-thousand-pound and one two-hundred-thousand-pound screw and one sixty-thousand-pound Hydraulic testing machines arranged for tension, compression and transverse testing, a four-thousand-pound wire tester and a small machine for testing cord, twine, etc., a four-thousand-pound transverse machine for specimens up to sixteen feet, and a smaller transverse machine for specimens up to five feet, arranged with micrometers for measuring deflections and extension meters for measuring fiber deformation, a transverse machine of two-hundred-thousand-pound capacity for specimens up to twenty-five feet is now in course of construction, a torsion machine of 125,000 inch pound capacity for specimens up to twenty feet in length and a 10,000 inch pound torsion machine of the pendulum type for short specimens, a number of elongation meters of different types, compressometers and smaller micrometers, hand tools, etc., and apparatus for calibrating machines. There are also a number of special apparatus for shearing, punching, bending, etc., tests.

The Cement Laboratory contains two one-hundred-thousand and one one-hundred-thousand-pound machines for testing cement by tensile, compressive, and transverse stress, a machine for moulding briquettes under pressure, a power-driven Boehme Hammer, an automatic sieving apparatus, apparatus for accelerated tests, etc. It is further equipped with large immersion tanks with running water cement bins, briquette racks, and the necessary moulds, sieves, scales, moist closets, specific gravity apparatus, etc. It also contains a number of slate-top mixing tables, each provided with a moist closet, scales and the necessary hand tools.

The Hydraulic Laboratory contains a vertical pressure tank eighteen feet in height and five feet in diameter, arranged for making experiments on the flow of water through orifices and nozzles under heads up to three hundred feet, and provided with a device by which the orifice plates can be removed while the tank is under pressure; other smaller tanks for use under low heads; a stand-pipe sixty feet high; two tanks, thirty feet long for weir experiments and measurements of quantity; a turbine, impulse wheels, centrifugal pump, pulsometer, rotary, disc and reciprocating water meters, a Venturi meter, a weighing tank, absolute and differential pressure gauges, and other appliances for the measuring of water is used in experiments and for the testing of meters, motors, nozzles and fire hydrants; as well as arrangements for lecture-room illustrations. There is also connected with the laboratory a boiler plant and a one-million gallon Worthington duplex pump upon which tests are made.

THE ROAD MATERIAL LABORATORY.

Arrangements are being made to enlarge the concrete laboratory which, when completed, will contain mixing and immersion tanks for beams up to fifteen feet in length, and the necessary moulds, also moulds for compression specimens, a beam crane for the convenient handling of specimens, scales, sieves, measures, storage bins for stone, sand, cement, reinforcing bars, etc.

The laboratory contains a rattler for testing paving brick, and power for driving the same, hot oven, scales, immersion tank, etc.

The shop, which is in charge of a skilled mechanic, contains two lathes, a drill press, a planer, a milling

machine a grinder and other necessary appliances for preparing test specimens for use in the laboratories, models and apparatus, and for repair work.

The library contains the best and latest books and periodicals upon engineering subjects and the students are encouraged to make free use of the same.

In the following schedule the numbers in parentheses refer to corresponding numbers in the section entitled "Special Subjects," pages 93-98.

SYNOPSIS.

CIVIL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Hours.
MATHEMATICS.—Algebra (Wentworth).....	4
CHEMISTRY.—Descriptive, Non-Metals (Hart); Recitations and Laboratory.....	4
MODERN LANGUAGES.—German or French Grammar, Composition and Translation.....	2
ENGLISH.....	2
DRAWING.—Elements of Industrial Drawing. Use of Instruments. Freehand Lettering. (Faunce-Reinhardt).	2
HYGIENE.—Lectures. First Aid to Injured, Bandaging, etc.	1
THE BIBLE.....	1

Second Term.

MATHEMATICS.—Trigonometry (Crawley).....	5
CHEMISTRY.—Descriptive Metals (Hart). Lectures. Recitations and Laboratory.....	2
MODERN LANGUAGES.—French.....	2
GERMAN.....	2
ENGLISH.....	2
DRAWING.—Elementary Projections, Freehand Lettering...	2
THE BIBLE.....	1

Third Term.

MATHEMATICS.—Spherical Trigonometry (Crawley) Analytical Geometry (Ashton); Mensuration (Hall).....	5
CHEMISTRY.—Organic (Hart). Lectures, Recitation and Laboratory.....	2

MODERN LANGUAGES.—French.....	2
GERMAN.....	2
ENGLISH.....	2
DRAWING.—Shades and Shadows. Model Drawing. Free-hand Lettering.....	2
SURVEYING.—Instruments and Their Use (Raymond). Topographical Drafting (1).....	2
THE BIBLE..	1
SUMMER SCHOOL IN SURVEYING (in vacation) Transit Survey. Three weeks (1).	

Themes throughout the year.

SOPHOMORE YEAR.

First Term.

	Hours.
MATHEMATICS.—Analytical Geometry (Ashton's). Differential Calculus (Hall).....	5
CHEMISTRY.—Qualitative Analysis.....	2
MODERN LANGUAGES.—French.....	2
GERMAN.....	2
ENGLISH.....	2
DESCRIPTIVE GEOMETRY, Point and Plane (Hall).....	2
SURVEYING.—Use of Level Instruments and Stadia (Raymond) Problems. Topographical Drafting (2).....	2
THE BIBLE.....	1

Second Term.

MATHEMATICS.—Differential Integral Calculus (Hall).....	5
CHEMISTRY.—Qualitative Analysis.....	2
MODERN LANGUAGES.—German.....	2
FRENCH.....	2
DESCRIPTIVE GEOMETRY.—Curves, Curved Surfaces and Solids (Hall).....	3
SURVEYING.—Use of Plane Table, Barometer, Sextant and Solar transit. Problems (Raymond's) (3).....	2
RAILROADS.—Railroad Curves, Simple, Compound, Reversed and Vertical (Allen) (3).....	2
DRAWING.—Descriptive Geometry Plates.....	2
THE BIBLE.....	1

Third Term.

	Hours.
MATHEMATICS.—Least Squares and Differential Equations...	3
CHEMISTRY.—Quantitative Analysis.....	2
DRAWING.—Machine Drawing, Tracing, Blueprints.....	2
RAILROADS.—Curves, Transition, Turnouts and Y Tracks [] (Allen). Construction, Maintenance of Way. Methods and Materials Used in Construction and Maintenance. [] (Camp). Drafting, Rails, Turnouts, Etc. (4)	2
PHYSICS.....	4
MECHANICS.—Elementary. Statics, Simple Machines.....	2
THE BIBLE.....	1
SUMMER SCHOOL IN SURVEYING (in vacation). Railroad Sur- vey. Three weeks (4).	

Themes throughout the year.

JUNIOR YEAR.

First Term.

MECHANICS.—Applied. Theory and Conditions of Equilib- rium. Center of Gravity. Moment of Inertia, Etc. Problems.....	4
PHYSICS.—Heat, Magnetism and Electricity. Laboratory..	4
CHEMISTRY.—Metallurgy of Fuels, Iron and Steel (Wysor)..	2
MINERALOGY.—Crystallography (Williams).....	2
RAILROADS.—Earthwork, Methods of Staking out and Com- puting (Allen's). Construction and Maintenances. Track Tools, Appliances and Equipment (Camps). Drafting, Map, Profile and Estimate of Survey Summer School (5).	3

Second Term.

MECHANICS.—Applied continued. Kinematics and Kinetics..	4
PHYSICS.—Acoustics and Optics. Laboratory.....	4
MINERALOGY.—Petrography III (Kemp, Harper).....	2
MECHANICS OF MATERIALS.—Elasticity and Strength of Wood, Stone and Metals. Theory of Beams, Columns and Shaft. Simple Designs (Merriman) (10)	5
TESTING LABORATORY.....	1
CEMENT AND CONCRETE.—Manufacture and Properties of Cement, Mortar and Concrete (Taylor).....	2

	Hours.
CEMENT LABORATORY.....	1
RAILROADS.—Economics, Location, Traffic, Operating Expenses and Car Construction (Webb) (6).....	2
Construction and Maintenance.—Signals, Yard Design, Etc... Management.—Lectures.....	2 1
ROADS AND PAVEMENTS.—Location, Construction and Maintenance of Roads and Pavements; Street Cleaning and Testing Road Material (Baker) (9).....	1
ROAD MATERIAL LABORATORY.....	1
SPECIFICATIONS AND CONTRACTS.—Lectures on Specifications (in general), Contracts, Bids, Bonds and Sureties (11)..	1
THE BIBLE.....	1

Third Term.

MACHINERY.—Steam Engine, Elevators, Cranes, Etc.....	4
MECHANICS OF MATERIALS.—Apparent and Combined Stresses, Compound Columns and Beams, Resilience and Work, Impact and Fatigue. True Internal Stresses. Rollers and Plates and Mathematical Theory of Electricity. (Merriman) (10).....	4
TESTING LABORATORY.....	1
MASONRY.—Study of Stone, Brick and Concrete Masonry; Foundations, Piers, Abutments. Retaining Walls, Dams, Culverts and Arches (Baker) (12).....	2
SANITARY BIOLOGY (16).....	2
MINERALOGY.—Descriptive. (Peck notes).....	3
THE BIBLE.....	1

SENIOR YEAR.

First Term.

ROOFS AND BRIDGES.—Simple Truss. Numerical and Graphical Methods. Designing of a Roof-truss, with working drawings (17).....	6
HYDRAULICS.—Theory of Hydraulics, Efflux of Water from Orifices and Tubes. Weirs. Flow in Pipes, Canals, and Rivers. Hydraulic Motors and Pumps (Merriman)	5
HYDRAULIC LABORATORY.—Tests of orifices, weirs, meters, motors, pumps, hydrants, valves and fire hose.....	1

	Hours.
GEOLOGY, VI.—Dynamic and Structural, Excursions and Field Work.....	2
ASTRONOMY.—Descriptive Astronomy (Young).....	2
THE BIBLE.....	1

Second Term.

ROOFS AND BRIDGES.—Continuous, Cantilever and Suspension Bridges. Numerical and Graphical Methods. Designing of Plate Girders with Design Drawings, Estimates, Etc. (17)	6
MASONRY DESIGN.—Dams, Arches and Culverts with Design Drawings (12).....	2
GEOLOGY VII.—Historic and Economic.....	2
ASTRONOMY.—Practical Field, Observatory and Office Work..	2
POLITICAL ECONOMY.....	2
WATER SUPPLY.—Source and Supply of Water for Towns. (Turneaure and Russell).....	3
SEWERAGE.—Disposal of Sewage and Garbage (Folwell) (15)	2
THE BIBLE.....	1

Third Term.

ROOFS AND BRIDGES.—Arches, Numerical and Graphical Methods. Designing of a Pin-Connected Railroad Bridge with Design Drawings, Estimates, Etc. (17).....	6
BRIDGE ERECTION.—Design of False Work and Field Practice in Erecting Full Weight Pin-Connected Truss. Three days latter part of term.	
ASTRONOMY.—Field Work. Determining Time, Latitude, Etc.....	2
WATER WORKS DESIGN.—Design of a Distribution System for a Small City with Map.....	2
SEWERAGE DESIGN.—Design of a Sewer System for a Small City with Map and Profiles (15).....	2
SURVEYING.—Field and Office Work. Precise Triangulation and Leveling. Elements of Geodesy.....	2
THE BIBLE.....	1
THESIS.	

Themes throughout the year.

SPECIAL SUBJECTS.

SURVEYING.

The theoretical study of surveying extends over four terms. During the term the field practice consists of solution of a number of problems, and surveys of small areas to illustrate the text. During the two Summer Schools at the end of the first and second years which lasts three weeks following commencement, more extensive surveys are made. The course includes the theory and adjustments of instruments, land surveying, leveling, topography, hydrography, triangulations, railroad reconnaissance and location, and the elements of geodesy. Particular attention is given to have the students become rapid and at the same time accurate instrument men; to be able to handle a corps advantageously, to keep neat and systematic notes and make a clear, neat and correct map. No error is allowed in the field or map which is not within the limits observed in correct practice.

(1) FRESHMAN YEAR, THIRD TERM.

Surveying, Lectures, Recitations, Field and Office Work. Use of Chain, Tape, Compass and Transit. Topographical Drafting. Text-books, Raymond's, "Plane Surveying."
Summer School of Surveying (in vacation) Three Weeks. Transit Survey of College Grounds.

(2) SOPHOMORE YEAR, FIRST TERM.

Surveying, Lectures, Recitations, Field and Office Work. Use of Leveling Instruments and Stadia. Topographical Drafting. Text-book, Raymond's, "Plane Surveying."

(3) SECOND TERM.

Surveying, Lectures, Recitations, Field and Office Work. Use of Plane Table, Barometer, Sextant, Slide Rule and Solar Transit. Text-book, Raymond's, "Plane Surveying."

Railroads, Lectures, Recitations, Field and Office Work. Railroad Curves, Simple Compound, Reversed and Vertical. Text-book, Allen's, "Railroad Curves and Earthwork."

(4) THIRD TERM.

Railroads, Lectures, Recitations, Field and Office Work. Railroad Curves, Turnouts, Y Tracks and Transitions. Text-book, Allen's, "Railroad Curves and Earthwork."

Construction and Maintenance of Way, Methods and Materials used in Track Construction and Maintenance. Text-book, Camp's, "Notes on Track."

Railroad Drafting, Rails, Turnouts, etc.

Summer School in Surveying (in vacation) Three Weeks. Complete Railroad Survey, Reconnaissance, Preliminary Location.

(5) JUNIOR YEAR, FIRST TERM.

Railroads, Lectures, Recitations, Field and Office Work. Earthwork, Methods of Staking Out and Computing. Text-book, Allen's "Railroad Curves and Earthwork."

Construction and Maintenance of Way, Track Tools, Track Appliances and Equipment. Text-book, Camp's, "Notes on Track."

Railroad Drafting, Map, Profile and Estimate of Railroad Survey made in Summer School.

(6) SECOND TERM.

Railroads, Lectures, Recitations and Office Work. Railroad Economics, Estimation of Volume of Traffic, Operating Expenses, Economics of Locomotives and Car Construction. Text-book, Webb's "Economics of Railroad Construction."

Construction and Maintenance of Way, Signals, Yard Design, Etc. Text-book, Camp's "Notes on Track."

Railroad Management (Lectures). No text-book used.

Railroad Design, Paper Location of a Railroad, with Profile and Estimate. Each Student Solves a Different Problem.

(7) THIRD TERM.

Railroad, Lectures, Recitations and Office Work. Railroad Economics, Track Economics, Train Resistance, Virtual Grades, Distance, Curvature, Minor Grades, Pusher Grades, Ruling

Grades, Balancing Grades for Unequal Traffic. Text-book, Webb's "Economics of Railroad Construction."

Railroad Transportation Problems (Lectures). No text-book used.

Railroad Design, Design and Estimate of a Freight Yard.

(8) RAILROAD ENGINEERING.

The work in this subject is treated under four heads: theory, field practice, office work and design. The theory includes the mathematical discussion of curves, frogs switches and crossings; economic location, methods of calculating earthwork; railroad construction: maintenance of way; and railroad management. The field practice consists of the staking out of curves, switches, etc.; and a complete location during the second year summer school of an imaginary railroad, including reconnaissance, preliminary survey, slope staking and the preparation of the necessary maps and profiles. The office work consists of computations of earthwork from the cross-section notes obtained in the field. The work in design comprises the paper location of a railroad with profile and estimate and the design of a freight yard.

(9) ROADS AND PAVEMENTS.

This course comprises the reconnaissance, location, construction and maintenance of town and country roads, city streets and pavements, together with the methods of street cleaning. Thorough tests of paving brick of different manufacture and other road material are made in the Road Material Laboratory.

(10) MECHANICS AND MATERIALS.

This subject extends over two terms and is treated by means of lectures, text-books, laboratory practice and simple designing sufficient to thoroughly fix in the mind the principles of stress and strain, the behavior of ma-

materials under tension, compression and shearing stresses, investigation and design of pipes, riveted joints, boilers and stand-pipes; strength and flexure of simple, cantilever, restrained and continuous beams variously loaded; formulas for columns, shafts, investigation and design of rolled and built beams, shafts, columns, reinforced concrete beams and columns. Study of impact and fatigue, true internal stresses and the mathematical theory of elasticity. In addition to the solution of numerous problems each student designs and presents a working drawing of an I beam Highway Bridge, a reinforced concrete floor, and a steel standpipe.

(11) SPECIFICATIONS AND CONTRACTS.

This subject is treated from the engineering standpoint. The character of specifications and contracts is set forth and practical talks are given on bonds, sureties and the preparation of bids.

(12) MASONRY.

Instruction is given in the requisites of stone, brick and cement, the methods of preparing and using mortar and concrete; the different kinds of bonds; strength of stone, brick and concrete masonry; and the construction of foundations bridge piers, abutments, retaining walls, dams, culverts and arches. The course in theory is followed by a course in design in which each student is required to design a dam, an arch and a culvert; using both graphical and numerical processes. The course in masonry includes tours of inspection of structures both finished and in process of erection.

(13) HYDRAULICS.

This subject is treated by recitations and laboratory

work conjointly and includes the study of head, velocity and discharge in the case of orifices, weirs, pipes, canals and rivers; the measurement of water-power; and the determination of the efficiency of turbines, impulse wheels, centrifugal pumps and pulsometers, rams, etc.

(14) WATER SUPPLY.

In order to prepare for a problem in design which follows, the requisite for a good water, the available sources of supply, the construction of pumping plants, reservoirs and pipe lines, together with the purification of water and its distribution to the public are first treated by means of recitations and lectures. This work is followed by the design of a water supply system for a small city and each student is required to submit a report. The course in Water Supply includes the inspection of water works both completed and in the process of construction.

(15) SEWERAGE.

This course is composed of two parts, theory and design, and treats of the disposal of sewage and garbage. It includes the determination of the size and capacity of sewers, inlets and flush tanks for all cases which commonly occur in practice. The text-book work and lectures are followed by the design of a town sewerage system for which each student is required to submit a map and written report.

(16) SANITARY BIOLOGY

precedes the courses in Water Supply and Sewerage and consists of class-room and laboratory work. The course treats of the cause and prevention of disease, the filtration of water and of sewage, the rôle of bacteria in the

septic tank, the effect of polluted water on the health and the biological analysis of water to determine its potableness.

The Biological Laboratory is used by students in this course prior to their work in Water Supply and Sewerage. It contains equipment fitted for the study of Sanitary Biology, *viz.*, twenty compound microscopes, a dozen aquaria, several sets of Sedgwick-Rafter apparatus, modern sand and house filters, drying ovens, sterilizers, incubators, fermentation tubes, petri dishes, etc., furnishing the necessary facilities for a practical study of the algae, aquatic animals and bacteria relating to sewage disposal and water supply.

(17) ROOFS AND BRIDGES.

This course extends through three terms and includes the computations of stresses in simple, continuous, cantilever, suspension, and arch bridges, roof trusses and towers by both numerical and graphical methods. In addition to the above, each student designs a roof truss, a plate girder and then a pin-connected bridge, according to standard specifications, making full computations, design drawings, bills of materials and estimate of cost, special attention being given to an economical design and to joints and other details. Actual practice is given by the erection each year by the students of a full weight pin-connected bridge belonging to the Department, after having designed the false work.

MINING ENGINEERING COURSE.

Professor Hall and Messrs. Brasefield, Colliton and Marquard.

The aim of this course is to provide a good education,

to lay a sound foundation in Engineering, and to give special preparation in Mining, Geology, Chemistry, Metallurgy, and Assaying.

The courses in Surveying, Analytical Mechanics, Mechanics of Materials, Materials of Construction, Laboratory Physics, and Railroad Engineering have been fully described in connection with the Civil Engineering Course.

The courses in Mathematics, Languages, Physics, and Pure Graphics are the same in all the Engineering Departments, and have been presented.

A course in the Theory of Steam Engineering is followed by Graphical Constructions and Computations.

In Mechanical Engineering, after the courses in Analytical Mechanics, Mechanics of Materials, Materials of Construction, and Graphic Statics, a term of Machine Design and Construction is given.

In Surveying, the theory and practice extends through the first three years, and includes: Chain, Compass, Transit Surveying; Adjustment of Instruments; and Leveling; City Surveying; Location and Construction of Roads, Streets, and Pavements; Topographical Surveys; Railroad Reconnaissance, Location, and Construction, with Profile Plans, Earthwork Calculations, Bills of Material, Estimates, Specifications, and Contracts; Theory of Mine Surveying, and the actual survey of a mine.

Following the course in Electricity as given in Physics, two periods each week for two terms are devoted to the study of Electrical Machinery with selected laboratory work, having especial reference to the application of electricity to mining operations.

The course in Drawing includes: Elements of Mechan-

ical Drawing, tracings and blue prints; Free-hand Drawing and Lettering; Descriptive Geometry; Topographical Drawing; Graphic Statics; Map Drawing; Machine Drawing and Design. Additional drawing is also required in connection with mining problems.

The work in Chemistry begins with the first term of the Freshman year, and continues, without any break, for two and one-half years. Lectures and text-book study are accompanied by recitations and laboratory practice.

Metallurgy is given in two terms, and embraces the metallurgy of iron, steel, gold, silver, copper, lead, zinc, etc. Thorough courses are also given in Assaying and Blowpiping.

Particular stress is laid on a thorough course in English, which extends over the first two years. The course includes the study of Rhetoric. Both German and French are studied each term for the first two years. Two periods each week for one term are devoted to the study of Political Economy, and the same length of time is given to the study of the Constitution of the United States. A theme written on some assigned technical subject is required of the student each term.

In addition to the courses in Mineralogy and Geology, as previously explained, the mining engineers are given a course of two hours each week for one term in the study of Ore Deposits (Course VIII), and a course of the same length is given in Field Geology (Course IX). Instruction in the classroom will be supplemented, so far as possible, by a study of the different kinds of ore, and of the "country rock" in which they occur. A special course in the modern methods of determining rocks in

thin sections by means of the polarizing microscope, with instruction in the proper methods of preparing and mounting the sections, will be offered; and practice in the ordinary methods of field work in geology, with the mapping and sectioning of a certain region, will be given.

The course in Mining proper begins with the Theory of Mine Surveying and the solution of problems for determining the position of faulted ore bodies. Then follows Prospecting for ore deposits in lodes, beds, and placers; Prospecting for magnetite with the magnetic needle, and borings for water, oil, and gas. The study of Rope, Rod, and Diamond Drill Boring is followed by that of Blasting and Excavation. In this connection the various tools, machines, and explosives are studied, together with their application in Blasting and Quarrying. Shaft Sinking, Shaft Boring, and Tunneling are studied, together with the materials for the support of excavated spaces and the methods of their application. While all the methods of Exploitation are investigated, particular attention is given to the mining of soft ore bodies, and of anthracite and bituminous coal. In the treatment of Haulage and Winding, special consideration is also given to the requirements of coal mining. Prominence is given to the study of Ventilation and Lighting because of their great importance in coal mining. The subject of Drainage receives careful treatment. Mining Law is studied with reference to locations on public lands, and also with reference to the prevention of mine accidents. The Mechanical Separation of Ores is studied, and designs and reviews of Special Mining Operations are made. The principles involved in determining the values of Mines and Quarries are discussed.

The Mining Engineer students use a separate room as a study. This is provided with an excellent Mining Library, and is supplied with the leading Mining periodicals. By the aid of a topical index, the library is regularly used in the study of the subjects assigned. The student is in this way led to many original sources for information, and becomes acquainted with the prominent works on Mining.

Magnetite, hematite, and limonite iron mines are close at hand, and the anthracite coal mines and zinc mines are easily accessible; these, with extensive quarries of slate, limestone, steatite, granite, serpentine, and sandstone in the vicinity, offer excellent opportunities for the study of mining and quarrying operations.

The Ingersoll-Sergeant Drill Company, one of the largest manufacturers of mine machinery in the world, is located at Easton. This gives the Mining students the opportunity of seeing the construction of important mine machinery and of testing the machines.

Frequent visits are made to the mines and quarries in the vicinity, and two weeks in the spring vacation are spent at some prominent mining region in the practice of Mine Surveying and in the study of Practical Mining. Students are advised to spend one long summer vacation during their course in actual work at the mines.

On the spring trip of 1907 a visit was made to the iron and zinc mines of northern New Jersey, after which a tour of inspection was taken in that region. During the long summer vacation of 1906 a trip was made to the great iron ranges of Minnesota and the famous copper region of Michigan.

The equipment of the Department contains: a separate

mine library, maps, charts, models, complete mine survey outfit, photographs, sample collection of ores, projecting lantern with several hundred slides, small machines and machine parts, working drawings with bills of material, trade catalogues, etc.

Attendance at one session of the Summer School of Surveying is required of the Mining Engineering students, and attendance at the second session is strongly recommended.

The students in Mining Engineering have the privilege of electing additional work in Chemistry or Mining Geology.

SPECIAL SUBJECTS.

PROSPECTING.—Physical character of deposits. Geological indications. Prospecting for placer vein and bedded deposits. Preliminary workings. Sampling. Examination and valuation of mining properties. Location of claims and application for patents. Placer and hydraulic mining.

DEEP BORING.—Uses and location of bore holes. Rod percussion drilling. American system of rope drilling. Diamond drilling. Special methods; Davis Calyx drill, Mather and Platt's system, Kind's system, hydraulic boring, etc. Survey of bore holes. Shaft sinking by boring.

BLASTING AND QUARRYING.—Explosives. Tools for boring blast holes, particularly machine rock drills. Determination of size of blast hole and amount of charge. Location of bore holes. Firing, especially by electricity. Slate quarrying. Quarrying of building material. Open mine workings.

SHAFT SINKING, DRIFTING AND TUNNELING.—Excavations. Support of excavations by timber, metal, cement and masonry. Mode of approach and location of opening. Sinking through strata of different kinds. Gangway driving. Special sinking methods; piling, Drums, freezing process, Triger's method, Kind-Chandron system, Lippman's system.

EXPLOITATION.—Different systems of coal and metal mining

on the surface and ~~and~~ underground. Mining machinery. Comparison of methods of development.

TRANSPORTATION.—Underground haulage; motors, road-bed, and cars. Rope haulage. Self-acting planes. Surface haulage. Hoisting; motors, ropes, brakes, drums, guides, cages and attachments. Safety appliances. Head frames. Loading and unloading. Signaling. Stocking and storing of ores.

VENTILATION AND LIGHTING.—Atmosphere of mines. Testing the air. Explosions. Natural ventilation. Furnace ventilation. Mechanical ventilation. Instruments for measuring the resistance of airways. Mine fires. Laws. Lighting; different methods. Safety lamps. Electric lighting. Laws.

MINE DRAINAGE.—Mine pumps. Water column pipes. Dumps. Dams. Hoisting water. Drainage tunnels. Siphons. Erection and care of pumping machinery.

MINE SURVEYING.—Instruments. Location of stations. Underground traversing. Different methods of connecting surface and underground surveys. Mapping. Corrections for top and side telescopes. Surveys of mineral lands and claims. Calculation of ore in sight. Problems in mine surveying.

MINE CONSTRUCTION.—Graphical and analytical methods for finding stresses. Building materials. Mining structures. Foundations, trestles, head-frames bridge and roof trusses, ore-bins, tipples, etc.

ORE DRESSING.—Principles involved. Rock crushers, rolls and stamps. Ore feeders. Classifying machinery. Concentrating machinery; jigs, briddles, tubs, tables and vanner. Magnetic concentration. Amalgamation. Concentrating mills.

MINE ADMINISTRATION.—Mine accounts. Organization and management. Employment of labor.

SYNOPSIS.

MINING ENGINEERING COURSE.

The Freshman and Sophomore years are the same as in Civil Engineering (see page 88).

JUNIOR YEAR.

First Term.

	Hours.
APPLIED MECHANICS.—Theory and Conditions, Centre of Gravity, Moment of Inertia, Problems, Etc.....	4
PHYSICS.—Heat, Magnetism and Electricity (one period in Laboratory).....	4
RAILROAD.—Office Work; Paper Location; Earthwork Calculation; Overhaul; Map of Location, Railroad Construction; Lectures and Recitations.....	3
MINERALOGY.—Crystallography I.....	2
CHEMISTRY —Metallurgy of Iron and Steel.....	2
THE BIBLE.—New Testament Epistles in German.....	1

Second Term.

APPLIED MECHANICS.....	4
MECHANICS OF MATERIALS.—Elasticity and Strength of Wood, Stone, and Metals. Theory of Columns, Shafts, and Beams. Testing Laboratory.....	3
PHYSICS.—Acoustics. Optics (one period in laboratory)..	4
METALLURGY.—Gold, Silver, Copper, Lead and Zinc.....	2
MINERALOGY III.....	2
THE BIBLE.....	1
SPANISH (Optional).....	2
MINING.—Practical Work in the Mines in the Spring Vacation.	

Third Term.

MECHANICS OF MATERIALS.—Theory of Continuous Beams; Combined Stresses; Concrete Beams and Columns Reinforced; Resilience and Work; Principle of Least Work; Impact and Fatigue; True Internal Stresses; Thick Cylinders, Rollers, Plates and Spheres; Testing Laboratory.....	4
STEAM ENGINEERING.....	4
MINERALOGY V.....	3
MINE ENGINEERING.....	4
THE BIBLE.....	1
MINING.—Map of Mine Survey throughout the year. Technical themes.	
SUMMER SCHOOL OF SURVEYING (in vacation).....	Three weeks

SENIOR YEAR.

First Term.

	Hours.
HYDRAULICS.—Theory of hydrostatics; Flow of Water in Pipes, Canals and Rivers; Weirs; Efflux of Water from Orifices and Tubes; Hydraulics; Motors. Laboratory Work.....	5
MECHANICAL ENGINEERING.....	2
GEOLOGY VI.....	2
MINING.—Prospecting; Deep Boring; Blasting and Quarrying	3
MINE SURVEYING.....	1
ELECTIVES.	
CHEMISTRY.—Metallurgical.....	2
FIELD GEOLOGY.....	2
MINING.....	2

Second Term.

GEOLOGY.—Petrography.....	2
ASSAYING.....	2
ELECTRICAL ENGINEERING.....	2
POLITICAL ECONOMY.....	2
GRAPHIC STATICS.—Stresses in Trusses; Mine Constructions...	2
MINING.—Shaft Sinking; Tunneling; Exploitation; Haulage; Winding.....	5
THE BIBLE.....	1

Third Term.

FIELD GEOLOGY IX.....	2
ECONOMIC GEOLOGY.....	2
ELECTRICAL ENGINEERING.—Electric Mine Machinery.....	2
MINE ACCOUNTS.—Examination and Valuation.....	2
MINING.—Ventilation; Drainage; Ore Dressing. Designs for and Reviews of Special Mining Operations.....	7
THE BIBLE.....	1
GRADUATION.—Thesis.	

ELECTRICAL ENGINEERING COURSE.

Professors Moore and Dickinson.

This course was organized in response to an earnest

demand from students, who sought opportunities for study in this department of science. It is parallel to the other technical courses, and differs from them in substituting the study of Physics, especially Magnetism and Electricity, for the strictly professional portions of the other courses. Graduates in the department of Electrical Engineering, receive the degree of Electrical Engineer.

The laboratories are large and well arranged. The main electrical laboratory is thirty by sixty feet in dimensions, and is fitted up with representative types of continuous and alternating current generators and motors, lamp-banks, water rheostats, brakes, etc.; and the necessary instruments are supplied for loading and testing generators and motors.

The laboratory is supplied from the Easton Power Company's station, with two-phase alternating current, at a frequency of sixty cycles. This current is available for testing purposes.

A fifty kilowatt motor-generator set has recently been installed for the purpose of supplying the laboratory with direct current. This set consists of a seventy-five horse power induction motor, directly connected to two twenty-five kilowatt, 120 volt direct current dynamos, the current from which is supplied to the laboratory by means of the three wire system.

In case of need, direct current from the plant of the Easton Power Company is also available.

While designed primarily as a source of direct current, this motor-generator set is so installed as to be available at all times for experimental tests by the students.

The Testing Laboratory consists of two rooms, each

being about twenty-two feet square. It contains the necessary delicate instruments for accurate testing, among which are a Leeds and Northrup Potentiometer, a Thompson Quadrant Electrometer, D'Arsonval Galvanometers, Wheatstone Bridges, Condensers, etc.

All laboratory work is quantitative as well as qualitative in character, special emphasis being placed on the necessity for precision in all work.

The departmental library is well stocked with the best works on electrical subjects, and is kept thoroughly up-to-date. The library, in connection with the laboratory, is regarded as an exceedingly important instrument of instruction.

The studies of the Freshman and of the Sophomore years, are the same as in the Civil Engineering Course, except that in the Sophomore year, Physical Laboratory work takes the place of Surveying.

In the following schedule, the numbers in brackets refer to the corresponding numbers in the section entitled "Methods of Instruction," pages 110-114.

JUNIOR YEAR.

First Term.

	Hours.
PHYSICS.—Heat, Electricity. Lectures and Recitations.....	4
ELECTRICAL LABORATORY (6).....	2
ELEMENTS OF ELECTRICAL ENGINEERING (1).....	2
APPLIED MECHANICS.....	4
DRAWING.—Descriptive Geometry.....	4
MINERALOGY.....	2
THE BIBLE.....	1

Second Term.

PHYSICS.—Acoustics. Optics. Lectures and Recitations...	4
ELECTRICAL LABORATORY (6).....	2

	Hours.
ELEMENTS OF ELECTRICAL ENGINEERING (1).....	2
APPLIED MECHANICS.....	4
MECHANICS OF MATERIALS.....	3
THE BIBLE.....	1

Third Term.

DYNAMO ELECTRIC MACHINERY (2).....	2
ELEMENTS OF ELECTRICAL ENGINEERING (1).....	2
ELECTRICAL LABORATORY (6).....	2
MECHANICS OF MATERIALS.....	3
STEAM ENGINE.....	4
THE BIBLE.....	1

SENIOR YEAR.

First Term.

DYNAMO ELECTRIC MACHINERY (2).....	4
ELECTRICAL LABORATORY (6).....	2
HYDRAULICS.....	5
DRAWING.—Machine Design.....	2
THE BIBLE.....	1

Second Term.

ALTERNATING CURRENTS (3).....	6
ELECTRIC POWER TRANSMISSION (4).....	3
THE TELEGRAPH (5).....	1
METHODS OF ELECTRICAL TESTING (7).....	1
ELECTRICAL LABORATORY (6).....	2
POLITICAL ECONOMY.....	2
THE BIBLE.....	1

Third Term.

ALTERNATING CURRENT MACHINERY (3).....	6
THE ELECTRIC RAILROAD (8).....	3
THE TELEPHONE (9).....	2
ELECTRICAL LABORATORY (6).....	2
THESIS.....	2
THE BIBLE.....	1

NOTE.—Laboratory work as herein stated in "hours," represents three hours of actual work, an "hour" indicating a "period" of that length.

METHODS OF INSTRUCTION.

Following is a detailed description of the courses of instruction in the strictly professional studies of the course.

(1) ELEMENTS OF ELECTRICAL ENGINEERING.

This course is designed to familiarize the student with the fundamental principles of Electrical Engineering, emphasizing especially the application of mathematics to the solution of practical problems. Thompson's Elementary Lessons in Electricity and Magnetism has been used as a basis for the work, but the text has been departed from quite widely.

Supplementary reading on assigned topics, followed by a written report to the class, is one of the features of the course. This has been found to awaken the interest of the students in their professional work, and to widen their outlook.

In the third term of the Junior year, two hours per week are devoted to the study of the elementary methods of electrical testing, with the idea of helping the student to more fully appreciate his laboratory work. Swenson and Frankenfield's Testing of Electromagnetic Machinery is used this term, in the class-room, and in the laboratory.

The course serves as a foundation for the work of the Senior year.

(2) DYNAMO ELECTRIC MACHINERY.

The text-book used in this subject is Thompson's Dynamo Electric Machinery. The text is followed closely. The subject is begun in the third term of the Junior year, occupying two hours per week, and is carried through the first term of the Senior year, occupying six hours per week during that term.

The student takes up carefully the theoretical and practical details concerning direct-current dynamos, motors and motor-generators. The course is designed to run parallel with the laboratory work.

Special attention is given to the subject of dynamo design, each student being required to design and draw a complete machine. During the first term of the Senior year, inspection trips to near-by electric stations are begun. A working knowledge of the subject is insisted upon, in order that the future engineer may at all times possess a complete mastery of this important branch of his profession.

(3) ALTERNATING CURRENTS AND ALTERNATING CURRENT MACHINERY.

This important branch of study is taken up by the aid of text-books, supplemented by lectures by the instructor. An analytical treatment is insisted upon, but only in so far as such treatment adds to an intimate and precise knowledge of the subject. Graphical methods are studied with a view to fixing firmly the principles of the subject.

The fundamental propositions dealing with alternating electromotive forces and currents are followed by a consideration of the subject of power in single and polyphase systems, its measurement, transmission, and sub-division.

In the third term of the Senior year, having mastered the fundamental principles, the theory of transformers and of alternating current dynamos and motors is taken up. Thompson's Dynamo Electric Machinery, Vol. 2, has been used in this work.

(4) ELECTRIC TRANSMISSION.

The transmission of power by the electric current is

begun by a study of direct current two-wire systems. This is followed by a consideration of three-wire systems, and by special systems of distribution.

The subject of alternating current transmission is then taken up, using as a text Hutchinson's Long Distance Electric Power Transmission. A mathematical study of the characteristic of long transmission lines completes the course.

The aim has been to emphasize the commercial features of the systems studied.

(5) THE ELECTRIC TELEGRAPH

The subject of wireless telegraphy is taken up, in the belief that every engineer should be familiar with the salient features of this most interesting of the modern applications of electricity. Collins' Wireless Telegraphy is studied as a text supplemented by practical experiments in the laboratory. The theoretical portions of the subject are taken up, but special emphasis is laid upon the practical features.

(6) ELECTRICAL LABORATORY.

The course in Electrical Laboratory begins with the measurement of resistance, the subject occupying the greater portion of the first term of the Junior year. Ordinary Wheatstone Bridge methods are first studied, including the Carey-Foster method and the Murray and Varley Loop tests for locating faults in distributing systems. Methods for measuring very high and very low resistances are next taken up.

This is followed by a study of methods of comparing electromotive forces, and of the principles underlying current-measuring instruments. These with magnetic

tests and experimental comparison of capacities occupy the greater portion of the work of the second term.

In the third term of the Junior year the students are introduced to the more elementary problems connected with the running of motors and dynamos, as well as tests on arc and incandescent lamps.

The first term of the Senior year is occupied with the handling and testing of direct-current dynamos and motors. The student is taught to understand the management of these machines and the important characteristics of their behavior.

In the second term of the Senior year, experimental work with alternating currents is begun, followed by tests of transformers, measuring instruments, alternating dynamos, synchronous motors and induction motors. Apparatus for the study of wave form has recently been developed.

This course runs parallel with a theoretical study of the subject matter upon which the experiments are based.

The third term of the Senior year is occupied with thesis work, in the investigation of some original problem assigned by the instructor.

(7) METHODS OF ELECTRICAL TESTING.

Certain methods of testing dynamo electric machinery are in common use which are difficult of performance with the equipment of an ordinary laboratory. To familiarize the student with these methods, their study is taken up. The course is given by lectures and recitations, and occupies one hour per week.

The various opposition methods for testing direct current and alternating current machines are taken up carefully. Some attention is also given to the subject of

alternating current instruments which are used in commercial tests.

(8) THE ELECTRIC RAILROAD

The electric railroad introduces special problems in transmission and in the operation of electrical machinery. Therefore this course is not designed to produce a mere mastery of details of railway apparatus, but rather to develop that engineering instinct which will enable the engineer to apply knowledge already gained to the solution of special problems

The subject of systems of distribution is considered, the features of single phase commutator motors are discussed, and the subjects of train operation and control receive some attention. The course is largely lectures, supplemented by assigned reading, and by recitations.

An inspection trip to the large central stations of New York City has been made each year.

(9) THE TELEPHONE.

This course consists in a study of telephone systems, using Miller's American Telephone Practice as a textbook. Modern common battery systems are the principal subject of study, although the earlier systems are taken up in detail. A visit to the large exchanges in New York City has been a yearly feature of the course.

Automatic systems receive some attention, especially with reference to their possible use in manufacturing plants.

CHEMICAL COURSE.

Professors Hart and Wysor and Messrs. DeLong and Hess.

The aim of this course is to fit young men for practical work in chemistry, either as chemists in iron and steel works, in manufacturing establishments, or as chemical manufacturers. Great attention is paid to analytical chemistry, and especially to the chemistry of cement and the chemistry and metallurgy of iron and steel. Graduates are fitted to take paid positions as chemists immediately upon graduation. For men of the proper character immediate and remunerative employment can be secured. This course will also be found an excellent preparation for the study of medicine.

While the instruction centres in the two branches of Chemistry and Metallurgy, the course aims to supply a thorough education along the lines most necessary for a successful career as a responsible chemist. The same instruction in the Bible, Mathematics, Physics, the Natural Sciences, English, French, and German, which is required in the Engineering Courses, is required here, as will be seen in the synopsis. The study begins with a course of lectures on Descriptive Chemistry. In connection with these lectures each student is required to work in the laboratory. Each period of three hours is divided into a quiz of half an hour, two hours laboratory work and a half hour lecture, this division of time having been found most suitable. This course continues through Freshman year and includes instruction in Organic Chemistry.

In Sophomore year the descriptive chemistry is reviewed and after some introductory work, which includes a short study of gas analysis, volumetric and

gravimetric analysis, some electrolytic work and testing the balance and weights, Qualitative Analysis is taken up. The object of this introductory work is to demonstrate to the student by his own experience the necessity of careful work in order that correct results may be obtained. The drill in Qualitative Analysis is very thorough. At the same time great pains are taken to make it interesting and to illustrate practice by a study of theory with constant use of the library and the notebook. Daily recitations are held for which purpose the class is divided. Drill is also given in Chemical Arithmetic as a part of this course.

In the third term, Sophomore year, Quantitative Analysis is begun with instruction in sampling and the preparation of samples for analysis. At the same time a review of the Organic Chemistry, including the preparation of at least two organic compounds with detailed reports on the literature, is begun. This lasts until the end of second term, Junior year. Instruction in volumetric, electrolytic and organic analysis, in glassblowing, etc., are not made separate studies but form part of the laboratory work, and proficiency in each is insisted on.

The course in Chemistry is so planned that the Freshman and Sophomore years are spent chiefly in preparation. In Junior and Senior years those who are properly prepared are encouraged to spend most of their time in preparation for their future careers. This plan makes it unnecessary to multiply degrees in Chemistry which is not considered desirable.

It often happens that students taking this course are looking forward to a business career for which a study of chemistry is the most important preparation. In all

such cases the widest liberty of choice is allowed in Junior and Senior years. Thus, if a student expects to be a tanner most of his time is given to preparation for work in this field during these years. Students who are looking forward to the study of Medicine after graduation are allowed to substitute Toxicology, etc.

A large proportion of the graduates in the Chemical Course have become chemists in iron and steel works, and the following list of analyses required of men having this in view will give a good idea of the amount of work required:

1. Copper in Copper Sulfate.
2. Water of Crystallization in Copper Sulfate.
3. Lead in Lead Carbonate.
4. Silica, iron and alumina, lime (gravimetric and volumetric), magnesia, phosphorus (volumetric), and carbon dioxide in limestone.
4. Silica, iron and alumina, lime and magnesia in cement and cement mixtures.
5. Silica, iron (volumetric), alumina, manganese (3 methods), lime, magnesia, phosphorus (gravimetric and volumetric), titanium (gravimetric and colorimetric), chromium (volumetric), and sulfur in iron ore.
6. Sulfur, volatile matter, fixed carbon and ash in coal. The ash is examined for silica, iron and alumina, lime, magnesia, phosphorus and alkalies.
7. Copper in copper ores.
8. Lead in galena.
9. Zinc in zinc ores.
10. Manganese (colorimetric, gravimetric and volumetric), silicon, sulfur (gravimetric and volumetric), phosphorus (3 methods), carbon (2 methods), nickel (volumetric), tungsten, chromium, molybdenum, vanadium and aluminum in iron and steel.
11. Lead (2 methods), copper (3 methods), zinc, arsenic, antimony, iron, aluminum, manganese, nickel, tin, bismuth and phosphorus in alloys.
12. Hardness, acidity or alkalinity, alkalies, calcium, magnesium, iron and alumina, chlorine, sulfuric acid, carbonic acid, total solids and organic matter in boiler water.
13. Oxygen absorbed by organic matter, ammonia-free, combined and albumenoid, nitrites and nitrates in potable water.
14. Carbon dioxide and monoxide, oxygen, illuminants, hydrogen and methane in furnace and flue gases.
15. Carbon, hydrogen, nitrogen (2 methods), in organic compounds.

METALLURGY.—The course in metallurgy is calculated to give the student a full knowledge of the underlying principles and at the same time a clear idea of the practice. In the discussion of each typical process, the problems attending an increased output and a better quality of the product are emphasized as well as the problems involved in present conditions of practice. Special attention is paid to American metallurgical practice.

Two lectures a week are given. Following each lecture two hours are spent in the laboratory. The work here is chiefly upon fuels, refractory materials and metals. The efficiency of various fuels is determined and methods of firing are studied. Tests are made of refractory materials by means of the electric furnace and pyrometer. The effect of impurities, temperature and mechanical treatment upon metals is studied with the help of a metallographic outfit.

THEORETICAL CHEMISTRY.—Two hours per week for the whole of the Junior year are devoted to the study of the theory of chemistry. The following are among the subjects considered. The work is done partly in the recitation room and partly in the laboratory: 1. Specific Gravity Determinations. 2. Melting and Boiling Point. 3. Solubility. 4. Faraday's Law. 5. The Gas Laws. 6. Molecular Weights by 2 methods. 7. Electric Conductivity. 8. Periodic Law. 9. The Phase Rule. 10. Specific Heat. 11. Spectrum Analysis. 12. Microscopic Crystallography. 13. Photographic Work. 14. Calorimetry. 15. Polariscopic Work.

INDUSTRIAL CHEMISTRY.—Two hours per week during the first term of Senior year are given to the study

of Industrial Chemistry. This is supplemented by preparation work in the industrial laboratory. No attempt is made to cover the whole field but attention is concentrated upon the preparation of the so-called "heavy chemicals," each of which is carefully treated from a commercial standpoint. This work is further supplemented by evening lectures by persons engaged in the chemical industries.

ASSAYING.—This covers two periods of six hours for the second term Junior. Most of the time is devoted to silver, gold and lead. The equipment comprises two Burlingame Furnaces (such as are used in Denver), each having three large muffles.

Partial or special students may enter the laboratories at any time, provided they have sufficient knowledge of chemistry to work advantageously. Advanced students have opportunity for continuing their studies or for conducting investigations.

The department is now housed in Gayley Hall, a fine new fire-proof building erected especially for it by James Gayley, of the Board of Trustees. This building contains four large and several smaller laboratories, lecture rooms, quiz room, assay laboratory, metallurgical laboratory, crystallizing and gas analysis rooms.

Large additions have been made to the equipment within the past year. The metallurgical laboratory contains a full shop equipment, grinding machinery and electrical furnaces for roasting ores at uniform temperatures. There is also an electric pyrometer and metallographic outfit for testing the heat treatment of metals. Among the pieces of apparatus bought during the year are a fine spectrometer, Beckmann apparatus, Parr

calorimeter, Kryptol furnace, metallographic outfit, and oil furnace and viscosimeter. Throughout the different laboratories no expense or pains have been spared to bring them into harmony with the best current practice. A course of lectures, mostly by graduates of the department now engaged in practical work, is given annually in the lecture room of Gayley Hall.

The Henry W. Oliver Chemical and Metallurgical Library has a separate room in this building, and is open to students during study hours and on Monday, Tuesday, Thursday and Friday evenings from seven to ten o'clock. This library was endowed by Henry W. Oliver, of Pittsburg. The collection of chemical books formerly belonging to the college has been added to it by vote of the Trustees, and considerable additions are annually made by purchase and gifts. In 1901 a complete and very beautiful set of the *Berichte der deutschen chemischen Gesellschaft* and in 1903 a complete set of the *Journal of the Iron and Steel Institute* were added; in 1904 a complete set of the *Transactions of the Institute of Mining Engineers* was presented by a friend of the College and the set of the *Annales de chimie et de physique* was completed. Numerous single volumes and dictionaries were also acquired by gift or purchase.

A friend of the College has bought and presented to the Henry W. Oliver Chemical and Metallurgical Library all the pamphlets, about 3,000 in number, belonging to the library of the late Prof. Johannes Wislicenus, of the University of Leipsic.

This library represents the collection of fifty years of great activity, and will be a great addition to the Oliver Library. It is now being indexed and bound. The Oliver Library now contains about 1800 volumes.

In addition, the students have access to Professor Hart's private chemical library, embracing about one thousand volumes. These libraries contain full sets of the *American Journal of Science*, *Dingler's polytechnisches Journal*, *Wagner's Jahresbericht*, *Journal of the Society of Chemical Industry*, *Fresenius' Zeitschrift*, *American Chemical Journal*, *The Journal of the American Chemical Society*, *Zeitschrift für angewandte Chemie*, *Zeitschrift für anorganische Chemie*, *Zeitschrift für physikalische Chemie*, *Berichte der deutschen chemischen Gesellschaft*, *Annales de chimie*, *Journal of the Iron and Steel Institute*, *Transactions of the American Institute of Mining Engineers*, a nearly complete set of *Liebig's Annalen*, and partial sets of the *Comptes rendus*, *Bulletin de la société chimique*, *Journal für praktische Chemie*, *Chemical News*, *Journal of the Chemical Society*, *Chemisches Centralblatt*, and many dictionaries and special works upon Chemistry and Metallurgy.

SYNOPSIS.

CHEMICAL COURSE.

The Freshman and Sophomore years are the same as in the Civil Engineering Course, except that in the latter year Chemistry takes the place of Surveying in the first, second and third terms, of Descriptive Geometry in the second term and of Drawing in the third.

SOPHOMORE YEAR.

Third Term.

	Hours.
MECHANICS.—Elements of Mechanics (Moore) (one period in laboratory).....	4
CHEMISTRY.—Analytical Chemistry.....	6
CHEMICAL ARITHMETIC.....	3

	Hours.
ORGANIC CHEMISTRY.....	2
THE BIBLE.—The Acts.....	1
<i>Throughout the year—Declamations and Themes.</i>	

JUNIOR YEAR.

PHYSICS.—Heat, Electricity, Magnetism, Optics, and Acoustics, (First two terms) (one period in laboratory).....	4
MINERALOGY.— <i>First term</i>	2
<i>Second term</i>	2
<i>Third term</i>	3
SCIENTIFIC GERMAN.....	1
CHEMISTRY.—Theoretical and Practical, including Qualitative and Quantitative Analysis, and Laboratory work in Or- ganic Chemistry, and in Assaying. (8 hours first and second terms; 12 hours third term).....	8-12
THE BIBLE.—New Testament Epistles, in German.....	1
<i>Throughout the year—Declamations and Themes.</i>	

SENIOR YEAR.

CHEMISTRY.—Advanced work in all departments of Chem- istry, Metallurgy, Chemical Technology, with special work in some selected department. (14 hours first term; 12 hours second term; 14 hours third term).....	12-14
GEOLOGY.— <i>First term</i>	2
<i>Second term</i>	2
POLITICAL ECONOMY.—General Principles. (Second term) ..	2
HISTORY.—Lectures on the development of European institu- tions (Third term).....	2
SCIENTIFIC GERMAN.....	1
THE BIBLE.—History and Evidences.....	1
<i>Throughout the year—Themes and Extemporaneous Speak- ing. Chemical theses.</i>	

GENERAL INFORMATION.

ATTENDANCE.

Attendance on all College exercises is strictly required. Absences on account of sickness, or for other satisfactory cause, may be excused, and leave of absence will be granted at the request of parents when absolutely necessary. In such cases the absence is excused, but the student is invariably required to make up such work as he may lose by reason of his absence. Reports are sent to parents whenever the absences of their sons exceed a reasonable number. In cases of the absences becoming excessive, the faculty will punish the neglect with suspension. Absences incurred at the beginning and end of terms, especially if they involve absence from examinations, and immediately preceding and succeeding holidays, are regarded with special disapproval and under ordinary circumstances will not be excused.

Each student is expected to have sixteen recitations each week. Three hours of field or laboratory work are regarded as equivalent to one recitation period. The regular gymnasium drills are also regarded as required exercises as far as prescribed. No student is permitted to take a course involving fewer hours of recitation without a special vote of the Faculty.

EXAMINATIONS.

Examinations are held at the close of each term on the studies of that term, and may be either written or oral, or both, at the option of the professor in charge. In addition to these regular examinations, partial examinations and written recitations are held from time to time during the term, with or without notice to the stu-

dents Failure to attend an examination, except for reasons of absolute necessity, is regarded as a serious delinquency, and will be dealt with according to the circumstances of each case.

STANDING.

The scholarship of students is determined by the results of the examinations and daily recitations combined.

Students entering with conditions are required to make them up before the end of the term next after that in which they enter.

Students failing to pass in any studies of any term are required to make up such studies before the end of the next term, and they may be specially directed to do so at an earlier date. Students who do not comply with these regulations will be put on probation in scholarship, or lose standing and be only "permitted to recite," or be dropped into the next lower class, as the Faculty may, in each case, decide.

Reports of the standing of the students are made to their parents or guardians at the end of each term.

RULES GOVERNING ABSENCES AND RE-EXAMINATIONS.

1. No absence from a recitation, a lecture, or a laboratory exercise shall be excused.

2. If the number of a student's absences in any term from the exercises in any subject exceeds the number of exercises per week in the subject, but not double the number, he may, at the discretion of the teacher in charge, be debarred from the term examination in the subject, provided the number of absences is not less than three.

If he is debarred, he must pass on the subject before the first day of the next term or repeat the subject with a following class.

3. If the number of a student's absences in any term from any subject exceeds double the number of exercises per week in the subject, he must repeat the subject with a following class, provided that the number of such absences must exceed three.

4. If, for special reasons, the head of the department recommends it, the Faculty may vote that a student who would otherwise be required to repeat a subject by Rule 3 be given one examination on the subject. If he fails in this examination, he must repeat the subject.

5. Before a student may take the examination provided for in Rule 4, he shall be required to pay to the Treasurer of the College a fee of two dollars and show the Treasurer's receipt for the same to the teacher in charge of the examination.

6. The teacher in charge of each subject shall, at the beginning of each week, post in some place easily accessible to the students interested, the number of absences from the exercises of the subject of each student to date.

7. All absences shall be reported weekly to the Clerk of the Faculty, who shall record them.

8. When the number of a student's unexcused and unpermitted absences from the religious and other exercises of the College reaches five, he shall be warned by his class dean; when it reaches ten, he shall be again warned; when it reaches fifteen, he and his parents shall be warned that he is in danger of being dropped from the College rolls; when it reaches twenty, he shall be dropped.

PERMITTED ABSENCES.

9. In case of absence due to prolonged sickness or request from home for urgent reasons approved by the class dean, the student shall, as soon after the absence as possible, present to his dean a written statement of the cause of his absence, after which the dean shall give the student an exact statement of the duration of his absence, which he shall present to his instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then take it to the Clerk of the Faculty, and the absences indorsed upon it shall not be counted by the Clerk in making up the number of Rule 8.

When such permitted absence causes the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done by the class during as many of these absences as are required to bring his absences below the debarring number by an examination to be held within a month of the absences.

If he fail in this examination, he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before this special examination may be held, the student shall pay to the Treasurer of the College a fee of two dollars, and shall show his receipt for the same to the teacher in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

10. When permission to be absent from town has been given to a student by vote of the Faculty or by the President acting for the Faculty, such student shall receive from the Clerk of the Faculty an exact statement of the duration of such absence, which he shall present to his instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then return it to the Clerk of the Faculty and the absences indorsed upon it shall not be counted by the Clerk in making up the numbers of Rule 8.

When such permitted absences shall cause the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done during as many of these absences as are necessary to bring his absences below the debarring number by an examination held within a month of the absence.

If he fail in this examination he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before this special examination may be held, the student shall pay to the Treasurer of the College a fee of two dollars and shall show his receipt for the same to the teacher in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

11. If professors, in whose departments a student has the majority of his hours per week, report to the Faculty that the student is neglecting his work, he and his parents shall be warned that he is in danger of being dropped from the college rolls. If a second such report be made, he shall be dropped.

RE-EXAMINATIONS.

1. A student who fails at the regular term examination, in any subject, shall be entitled to one re-examination.

2. If, for special reasons, the head of the department recommend it, the Faculty may vote that a student who has failed in the re-examination provided for in Rule 1 may be given a second re-examination.

3. Before a student can take the second re-examination provided for in Rule 2, he shall be required to pay to the Treasurer of the College a fee of two dollars and show the Treasurer's receipt for the same to the instructor in charge of the examination.

4. If, at the beginning of the college year, a student has failed to pass on his conditions of the preceding year in the Departments of Mathematics, Mechanics, Physics, French and German—he shall be required to repeat the subjects in which he is still conditioned.

5. When subjects, which closely depend upon each other, are continued through successive terms, the department interested may require that all conditions of any term in those subjects shall be made up within two weeks from the beginning of the next term, in order that the student may go on with those subjects.

GRADUATION.

Students who have pursued the entire course as prescribed and have successfully passed their examinations

are recommended to the Trustees for the first academic degree in course. Such recommendations are ordinarily acted upon and the degrees are conferred at Commencement, at which time the students receive diplomas from the President of the College. At Commencement the Faculty awards such honors as it sees fit to those who are to receive degrees. These honors ordinarily consist of a valedictory oration, a Latin salutatory, and other honorary orations and theses.

COMMENCEMENT.

The third Wednesday in June and the three days immediately preceding it are set apart for the exercises in connection with the annual Commencement. On Sunday, the first of these days, a Baccalaureate sermon is preached in the College Chapel at eleven o'clock in the morning; and in the evening a sermon is preached in the auditorium of Pardee Hall before the Brainerd Society of the College by some distinguished minister selected by the Society.

The preacher in 1907 was Rev. Leighton W. Eckard, D.D., 66, of Philadelphia.

On Monday the Senior class holds its Class Day exercises on the Campus.

The Alumni and Literary Societies hold their reunions on Tuesday, and orations are delivered before the respective societies in the Society Halls.

The regular Commencement exercises are held in the auditorium of Pardee Hall on Wednesday morning, the afternoon being occupied by the Alumni dinner. All these exercises are open to the public. Various other exercises of an athletic or social nature are conducted



SOUTH COLLEGE.

THE
JOHN GREY
LIBRARY

on the part of the students under a general supervision by the Faculty.

DEGREES.

THE FIRST DEGREE.—The degree of *Bachelor of Arts* is conferred on the graduates of the Classical Course; *Bachelor of Philosophy*, on those of the Latin Scientific Course; *Bachelor of Science*, on those of the General Scientific Course; *Bachelor of Science* (in Chemistry), on those of the Chemical Course; *Civil Engineer*, on those of the Civil Engineering Course; *Engineer of Mines*, on those of the Mining Engineering Course; *Electrical Engineer*, on those of the Electrical Engineering Course.

MASTER'S DEGREE.

MASTER OF ARTS.—The degree of *Master of Arts* may be conferred one year after graduation on any *Bachelor of Arts* who has pursued a prescribed course of study, equivalent to sixteen recitations per week, during one year in residence, passed the examinations, and presented a satisfactory thesis.

The same degree may be conferred two years after graduation on any *Bachelor of Arts* who shall have devoted at least one year exclusively to advanced study under the direction of the Faculty, passed examinations in the studies pursued, and presented a satisfactory thesis.

Candidates for this degree must in all cases register on or before October 1st, and examinations must be held at the College at least once in each College term. Theses must be presented for approval not later than May 1st. A registration fee of \$5 and tuition fee of \$100 per annum for residents, and \$45 per annum for non-residents, is exacted of all graduate students.

MASTER OF SCIENCE.—The degree of *Master of Science* may be conferred upon any graduate of the Scientific Department upon conditions similar to those prescribed for the degree of Master of Arts.

DOCTOR OF PHILOSOPHY AND OF LETTERS.

The degree of *Doctor of Philosophy* may be conferred three years after graduation on any college graduate who, during three years of

continuous residence at the College, shall have devoted himself exclusively to advanced studies under the direction of the Faculty, passed examinations in them, and presented a satisfactory thesis. The candidate must designate three branches of study which he desires to pursue, each in a different department, one major or principal study, and two minor studies. The faculty will recommend for this degree men of high capacity and attainments only. Length of residence or time spent in study constitute no claim for its bestowal.

The regulations governing registration, examination, theses, and fees are the same as for the Master's degree.

Any graduate of a recognized college may be permitted to pursue graduate studies under the direction of the professors in the various departments upon satisfactory evidence of his fitness to do so. No curriculum is prescribed for such students. A course of study is usually arranged after consultation which will meet the specific object each student has in view

CERTIFICATES.

Students who have been admitted to any department of the College, and have passed satisfactory examinations therein, may obtain certificates of the work which they have done if they have been in attendance not less than one year.

RELIGIOUS INSTRUCTION.

The aim of Lafayette College is distinctly religious. Under the general direction of the Synod of Pennsylvania of the Presbyterian Church its instruction is in full sympathy with the doctrines of that body. At the same time religious instruction is carried on with a view to a broad and general development of Christian manhood within the lines of general acceptance among evangelical Christians, the points of agreement, rather than those of disagreement, being dwelt upon.

Prayers are held each morning in the Chapel at 7:50 and religious services in the Chapel Sunday mornings at 11 o'clock. All students are expected to attend these services. No exceptions will be made to this rule for morning prayers. Where there is some exceptional reason assigned by the parents, students will be permitted to attend one of the churches in Easton instead of the Sunday morning service. This permission will be granted only on request of parents and for sufficient reason.

Special sermons are preached before the College from time to time by distinguished ministers. The preachers for 1907 were: Rev. Charles R. Erdman, Princeton, N. J.; Rev. James Beveridge Lee, D.D., Milwaukee, Wis.; Rev. Jennings, Germantown; Rev. James I. Good, D.D., '72, Philadelphia; Rev. Robert Christie, D.D., Allegheny, Pa.; Rev. Albert J. Weisley, D.D., '91, Trenton, N. J.; Rev. Charles Stelzle, Chicago, Ill.; Rev. James H. Owens, D.D., Paterson, N. J.; Rev. James W. Gilland, D.D., '77, Shamokin; Rev. Samuel Semple, Titusville, Pa.; Rev. Joseph H. Odell, D.D., Scranton, Pa.; Rev. Robert Mackenzie, D.D., New York, N. Y.; Rev. Samuel A. Martin, D.D., '77, Shippensburg; Rev. Frank M. North, D.D., New York, N. Y.; Rev. John Harvey Lee, Germantown, Pa.; Rev. John B. Craven, '92, Wilkes-Barre; Rev. Henry F. Beatty, '87, Hoboken, N. J.; Rev. Stuart N. Hutchison, '00, Newark, N. J.; Rev. John Fox, D.D., '72, New York, N. Y.; Rev. William H. Roberts, D.D., Philadelphia; Rev. Charles E. Burns, '73, Bristol, Pa.; Membes of the Faculty and the local clergy.

The preacher for the Day of Prayer for Colleges, 1908, is Rev. John F. Carson, D.D., of Brooklyn, N. Y.

Instruction in the Bible has always held a prominent place in the College, and a full account of the courses in Bible study will be found on page 22.

LECTURES.

Special courses of lectures are given annually in connection with several departments and will be found under those departments. A more general course of a popular character is given each year.

Among those who have given lectures during the year 1907 are: Prof. A. Guyot Cameron, Princeton, N. J.; Hon. William H. Berry, West Chester; Rev. James Beveridge Lee, D.D., Chicago, Ill.; Dr. Edgar Moore Green, 83, Easton; Prof. J. M. Mecklin, Ph.D., Easton; Rev. J. F. Satchell, D.D., Easton; Rev. Samuel M. Jordan, '95, Persia; Prof. Rudolph Tombo, Ph.D., Columbia University.

TERMS AND VACATIONS.

The College year is divided into three terms, with intervening vacations, as given in the Calendar on page 5. All the classes are examined at the close of each term, and a report sent to the parent or guardian. Students are required to be present punctually at the beginning of each term, and are not allowed during term-time to be absent from town, except by written permission from the President.

The Wednesday after the 20th of October in each year is observed as Founders' Day, in memory of those who founded the College and of those who have since contributed to its usefulness. On Founders' Day, 1907, an address was delivered by LeBaron Russell Briggs, LL.D., of Harvard University.

BUILDINGS, LABORATORIES, LIBRARIES.

The College grounds are situated upon the summit of a beautiful hill, overlooking the city of Easton. They are reached by a flight of stone steps, which ascend the bold front of the hill directly from the head of Third Street, or by electric cars, which skirt the face of the hill by a gradual incline. At the head of the steps stands the monument erected by the Alumni Association to their comrades who "died for the Union." The grounds contain about forty acres terraced and laid out under the direction of Donald G. Mitchell. The buildings upon the campus are thirty in number. The oldest of these is

SOUTH COLLEGE.

The central portion of this structure is the original College building, erected in 1833. It contains several lecture-rooms and a number of dormitory rooms. Two wings were added to the original building, which contain the College Chapel and lecture-rooms for the English, Latin, and Greek Departments.

THE VAN WICKLE MEMORIAL LIBRARY.

The Van Wickle Library was dedicated on May 30th, 1900. It has given to the College one of the most needed additions to its equipment. A beautiful building of Pompeian brick and terra cotta, thoroughly furnished with the most approved appliances for library work, it is at once a most beautiful and useful feature in the College's development. It contains a large reading room, in which the periodicals and books of most constant reference are to be found; a reference book department; a large room for the general storage of the Library; Librarian's room, and small rooms for special work.

PARDEE HALL.

The most commanding position on the campus is occupied by this building, the most conspicuous evidence of the liberality of the late Ario Pardee, which reached to every department of the College. Here the departments of Civil, Mining, and Electrical Engineering, are supplied with thoroughly equipped laboratories, and lecture-rooms, and the museums of these departments, and of General Geology, Mineralogy, and Natural History, are to be found. The Ward Library and the handsome rooms of the two Literary Societies are also in this building, and the central portion of the second and third floors of the main building contains a beautiful auditorium, in which the Commencement exercises, lectures, and other public entertainments are held.

JENKS BIOLOGICAL HALL.

This building was erected in 1864-65 by the late Barton H. Jenks, of Philadelphia. It was recently entirely remodeled.

THE GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY.

Completed in 1902, is occupied by the departments of Chemistry and Metallurgy. The building consists of three stories, and is constructed of Indiana stone, Colonial brick, and gray terra cotta. It is fireproof, with steel and cement floors, and gives a thoroughly modern equipment to these departments. This building contains also the Henry W. Oliver Chemical and Metallurgical Library.

THE ASTRONOMICAL OBSERVATORY,
in addition to the observatory proper, contains a lec-

ture-room, with accommodations for the students in Astronomy.

WEST COLLEGE

contains the lecture-room of Dr. Francis A. March and the offices of the Registrar and Treasurer of the College.

THE GYMNASIUM,

which has already been sufficiently described on page 23, contains a complete equipment for physical training.

THE DORMITORIES.

A complete reorganization of the dormitory system was effected in the summer of 1900 by the building of central structures, known as Knox and Fayerweather Halls, to connect Blair and Newkirk Halls and Martien and Powell Halls respectively, and the facing of the completed buildings with mottled Pompeian brick, handsomely trimmed with red terra cotta. The architectural beauty of the buildings is in marked contrast with the former appearance of the separate buildings. These halls are connected with McKeen Hall in a common steam plant. A complete sanitary plumbing system of baths, sinks, closets, and electric lights has been installed in all the buildings. These improvements leave nothing to be desired for the health and comfort of the students.

INFIRMARY.

A building on the extreme northeast corner of the campus, facing upon McCartney Street, is set apart for the use of sick students, thus securing quiet and complete isolation in case of the occurrence of any contagious disease.

This building is intended solely for the use of students rooming in the College buildings.

BRAINERD HALL.

This building for the Y. M. C. A., the gift of J. Renwick Hogg, Esq., '78, of the Board of Trustees, was erected in 1902. It is a three-story gray stone building in the Tudor Gothic style. It contains a large room for the meetings of the society, and reading, writing, and committee rooms; also a trophy room for the Athletic Association, a room for the collection of curios from foreign missionary fields, and bowling-alleys in the basement.

Its object is to afford a home under active Christian influences for all forms of student life.

The remaining buildings consist of a large GREENHOUSE, a useful adjunct to the Department of Botany, and also supplying flowers and plants for the adornment of the grounds in summer and of the buildings on public occasions. Besides these, a number of buildings are occupied as the HOMES OF THE MEMBERS OF THE FACULTY. The intimate relations resulting from the residence of both Faculty and students upon the college grounds are regarded as one of the most wholesome features of the college life.

LIBRARIES AND READING-ROOM.

The main regular College Library occupies the Van Wickle Memorial Library, described above. The College Library was established at the foundation of the College, and has had a steady and uninterrupted growth since 1832, and is chiefly made up of books bearing directly on the courses of instruction. The Ward Library, the gift of the heirs of C. L. Ward, Esq., of Towanda, is largely made up of books of general liter-

ature and history and Political Science. Each of the Technical Departments has also a collection of books, magazines, and other scientific publications in rooms in immediate connection with their lecture-rooms and laboratories. By the gift of \$5,000 Mr. Henry W. Oliver laid the foundation of the H. W. Oliver Chemical Library in the new Gayley Laboratory. The foundation has been added to by gifts from Prof. Edward Hart and others, and the incorporation of the College's collection of chemical works.

A friend of the College has bought and presented to the Henry W. Oliver Chemical and Metallurgical Library all the pamphlets, about three thousand in number, belonging to the library of the late Prof. Johannes Wislicenus, of the University of Leipsic.

The Literary Societies, also, have libraries numbering about 6,000 volumes, largely of a literary character, which valuably supplement the more solid libraries of the College.

The College Library contains a papyrus scroll, five feet long, from a mummy at Thebes, with a hieratic inscription—pronounced by Seyffarth the finest he has seen—presented by the late Hon. John W. Garrett, of Baltimore, of the Class of '37, and a collection of prints and medals of General Lafayette presented by the late President William C. Cattell, D.D., LL.D.

There is also a full-length portrait of Lafayette, by Healey, presented by the late Dr. Thomas W. Evans, of Paris.

ALUMNI ALCOVE.—A collection of books and pamphlets written by the Students, Alumni, Faculty and Trus-

tees of the College is being gathered and set apart as a "Lafayette Library" to represent the literary activities of the College. This unique and valuable collection now numbers about 369 volumes, and includes a full set of the College Catalogues from 1832 to the present time, the Commencement addresses, and official publications of the College.

The LIBRARIES have received gifts, which are hereby gratefully acknowledged, from the following individuals and institutions:

Individuals:

Francis R. Abbott; Edwin Atlee Barber (3 pamphlets); James P. Boyd, '59 (8); Henry E. Fitzgerald Brown; Miss Ethel Louise Cox; Dr. B. Rush Field; John R. Freeman; W. W. Johnston; Robert Hammill Nassau; Prof. J. Madison Porter (12); Edward P. Remington; Prof. Allan Roberts (5); Hon. G. A. Schneebeli (8); Rev. Augustus Schulze, D.D.; Prof. J. W. Tupper; Alex. H. Voorhees; President E. D. Warfield (3); A. H. Welles (2).

Firms and Institutions:

Royal Society of Canada; Canada-Dominion Astronomical Observatory; Canada-Geological Survey Dept. (17 vols., 82 Pamphlets); Connecticut Bureau of Labor Statistics; Iowa Geological Survey; Lehigh University; S. S. McClure Co. (4); Maryland State Geologist; Michigan State Board of Health; New Jersey State Board of Health; New Jersey State Geologist; New York State Education Dept.; Penna. Dept. of Agriculture, Division of Zoology (2); Pennsylvania Society of Sons of the Revolution (3); Phi Delta Theta Fraternity—Penna. A Chapter; Theta Delta Chi Fraternity; University of Pennsylvania; Y. M. C. A. International Com.

United States Government: Bureaus and Departments, viz.:

Bureau of Education (2); Bureau of Ethnology (2); Bureau of Labor; Navy Department; Smithsonian Institution (7).

The Class of 1871 has given to the College a fund, the proceeds of which are to be used for the purchase of the publications of the Early English Text Society. The Library now contains a large and valuable collection of these.

The Class of 1875 at its reunion in 1905 by the gift of one thousand dollars established an alcove in the Library to be known as "The Francis A. March Alcove."

The Class of 1892 at its decennial reunion in 1902 established an alcove in the Library devoted to American literature. One hundred and eighty-two volumes have been purchased and additions will be made from time to time.

SCIENTIFIC COLLECTIONS.

These are extensive and valuable, and are rapidly increasing from year to year by gifts from societies and individual donors and by special appropriations in addition to the fees for registration and matriculation.

Among the most valuable of the collections may be mentioned the extensive Herbarium, collected by Prof. Thomas C. Porter during forty years of enthusiastic labor; it is especially rich in North America plants and is believed to contain the most complete Flora of Pennsylvania in existence and the series of Ward's celebrated casts, illustrating Geology and Palaeontology.

The apparatus in the Department of Physics and Applied Mechanics, the instruments used in the Departments of Astronomy and Engineering, and the scientific equipment of the numerous and extensive laboratories, meet the demands of advanced instruction in these departments; a special feature, however, is the series of nine hundred Wall Charts, executed at the College by Gustave Garnier, under the direction of the Professors in the Departments of Astronomy, Chemistry, Physics and Applied Mechanics, Metallurgy, and Natural History. There are valuable models in Machine Drawing, Stone Cutting, Crystallography, and Architecture.

COLLEGE SOCIETIES.

LITERARY SOCIETIES.

The *Washington* and *Franklin* societies were organ-

ized early in the history of the College and are conducted by the undergraduates. Both societies have well-furnished apartments in Pardee Hall, and valuable libraries. They meet every Wednesday evening for literary exercises, consisting of orations, essays, and debates. A generous rivalry for College honors exists between them, and each year representatives of the two societies from the Junior Class engage in a public contest in oratory. On the day before Commencement the societies hold reunion meetings in their halls. These societies are an important part of College life and work, and *all the students are strongly advised to join them.*

BRAINERD EVANGELICAL SOCIETY.

The *Brainerd Evangelical Society*, as a society of inquiry, meets each Thursday evening and on the first Friday of each month in the interest of missions, and for the promotion of Christian effort. Its public anniversary is held on Sabbath evening of Commencement week, at which time a sermon is preached usually by some former members of the Society. In 1907 the preacher was Rev. Leighton W. Eckard, D.D., '66, of Philadelphia.

BIOLOGICAL SOCIETY.

The *Biological Society* is for the purpose of making its members intelligent concerning the important biological questions of the day, enabling them to appreciate the value of research in nature. The membership consists of those students of the three upper classes who are either prospective or present members of the classes in Biology, and of such graduate students as are

interested in the laws of life comprehended through the Natural History Sciences.

CHEMICAL CLUB.

The *Chemical Club* meets every Thursday at seven o'clock, P.M., for reading and discussing papers contained in the current chemical magazines, and to listen to lectures from visiting chemists. During 1907-08 the Club listened to lectures from Dr. H. W. Wiley, Washington, D. C.; E. G. Acheson, Niagara Falls, N. Y.; and Dr. E. W. Morley, LL.D., West Hartford, Ct.

DEUTSCHER VEREIN.

This Society is organized to promote interest in the German language and literature. Meetings are held fortnightly. Lectures on German life and culture are given at each meeting.

EXPENSES.

The tuition is \$100 per annum in all departments. Sons of ministers of the Presbyterian Church and candidates for its ministry receive free tuition in the Classical Course, and are charged one-half tuition in the Technical courses.

The other College charges are as follows:

General Expenses.....	\$8.00 a term.
Library and Reading-room.....	5.00 "
Gymnasium.....	2.00 "

The annual College charges are, therefore, for those who pay tuition in full, \$145.

Entrance Fees.—Each student pays \$5 when he is registered for examination on entering College, and \$10 when he is matriculated, thirty days afterwards. These

fees are appropriated to the Library Fund and to the increase of the scientific collections and apparatus. No fees are charged for diplomas.

Laboratories.—Apparatus for the use of students in the Chemical Laboratories will be furnished and charged in their account, and the charge canceled for that returned in good condition. Chemicals and all other materials will be charged according to the average cost. A deposit sufficient to meet these expenses is made on entering the Laboratories. Members of the Classical Department are admitted to all the privileges of the Laboratories while studying General Chemistry, and, for the present, without charge for the aid of the professor in attendance; each student will, however, pay for chemicals which he uses, and for any apparatus which he may break or injure. In the Physical Laboratory a fixed charge of \$5 per term is made for supplies and the use of apparatus.

Scholarships.—The endowed scholarships providing free tuition in the Classical Course will hold good for the Latin Scientific Course, but students in the other courses of the Pardee Scientific Department are required to pay one-half of the regular tuition fee in addition to the scholarship.

Aid is also given to young men of ability and good moral character who are dependent on their own efforts for their education. The amount will depend on the necessities of the applicant, but in no case will exceed the amount of the tuition fees in the Classical and Latin Scientific Courses, or one-half the tuition fees in the other Technical Courses. Application for such aid should be made to the President. No aid is granted to students pursuing special or incomplete courses of study.

BOARD, ROOMS, WASHING.

In all cases the place of boarding must be approved by the Faculty. The price of table board in clubs managed by the students at present averages from \$3.75 to \$4.00 per week. Board, including furnished room, in private families, is from \$4.50 to \$6 per week. Washing costs 40 cents per dozen pieces.

Unfurnished rooms in the College buildings rent for \$5 to \$30 a term (average \$15.88); unfurnished rooms adjacent to the College premises for \$12 to \$16 a term, or furnished rooms for \$15 to \$30 a term.

Students are expected to room in the College dormitories unless they receive permission to room elsewhere. If they do not occupy College rooms, they are subject to an assessment to meet the loss to the College for rooms left vacant. The reason for this rule is that the funds of the College have been invested in the dormitories in order to secure cheap and convenient lodgings for the students, and it is to the advantage of all that the buildings should be occupied, the income from the investment being essential to the work of the College, and the students being protected against exorbitant rents.

Information in regard to the selection of rooms can be had from Professor Moore, Inspector of College buildings, the buildings being open for inspection during each term, and three days preceding the first day of each term. Rooms are assigned only to students who have been admitted to College, or who present full certificates from authorized schools, in the order of their application.

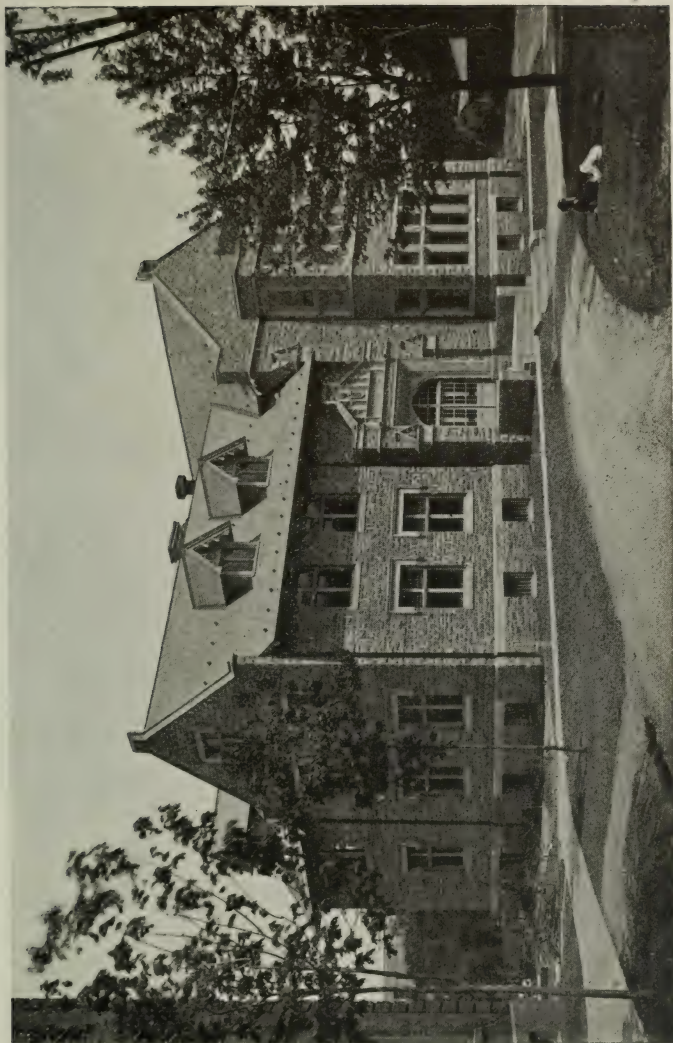
The rules of the Board of Trustees require that all

College bills shall be paid in advance. For the convenience of the students it is arranged that payments of the bills shall be made by the Seniors on the first Thursday of each term, by the Juniors on the first Friday, by the Sophomores on the first Saturday, and by the Freshmen on the first Monday. No student is regarded as regularly enrolled for any term until his bill is paid. He may be dropped from the roll for neglect of his bill at any time upon notice from the Treasurer to the Faculty.

Students entering after the middle of the term shall pay one-half of the College charges for the term. Students obliged, on account of sickness, to leave before the middle of the term may have refunded to them one-half of the college charges for the term; no reduction will be made to those leaving for any other cause.

Where it is impossible for a student to pay his bill on the day it is due, the Prudential Committee has power to extend the payment of the bill for not more than thirty days, provided that a written request is filed with the Treasurer *on the day the bill is due*, stating a satisfactory reason for the extension. A penalty of 10 per cent. will be added to every bill remaining unpaid after the expiration of thirty days, and no student whose bill is unpaid shall be permitted to take the term examinations. Those desiring the bill to be sent home, must call at the Treasurer's office during the first week of the term, acquaint themselves with the items of the bill, make the request that it be sent and give the address to which it is to be sent.

The care and regulation of the dormitories are under the direction and management of a Board of House



BRAINERD HALL.

Erected for the College Y. M. C. A., 1902, by James Renwick Hogg, '78.

THE
JOHN C. BERRY
LIBRARY

Representatives, elected by the students. House rules are enacted and enforced by the Board. The Parietal Committee, composed of the Inspector of Buildings and Officers of Inspection who reside in the dormitories, acts as a court of appeal.

Fuel Deposit.—The Treasurer also, on behalf of the Committee of Students, collects with the College bills \$6 at the beginning of the first and second terms for fuel. The unexpended balance, if any, is refunded by the Committee at the close of the year. Of late, the average cost for heating has been \$12.68 for each student in the steam-heated dormitories, and \$8.61 in the buildings heated by warm-air furnaces or stoves. The steam-heated dormitories are also lighted by electricity, the cost of which to each of the occupants is about \$6 a year.

A deposit of \$1 is also made at the beginning of each term to pay for public damages, the unexpended balance of which is returned to the student at the end of the year.

Annual Expenses.—Some money for books and other incidental expenses will be needed, but, with close economy, the total annual expenses—exclusive of tuition, clothing, and traveling expenses—need not exceed \$255, as will be seen from the following summary:

	Liberal.	Moderate.	Minimum.
General College Expenses.....	\$24 00	\$24 00	\$24 00
Charge for College Reading-rooms, Gymnasiums, etc.....	21 00	21 00	21 00
Board, 36 weeks, at \$3. 75 to \$4.50.	160 00	144 00	135 00
Rent of College-room, \$15 to \$90..	90 00	36 00	15 00
Light and Fuel.....	18 00	15 00	12 00
Washing.....	25 00	16 00	9 00
Tuition.....	100 00	100 00	100 00
Books and Stationery.....	38 00	21 00	16 00
	\$476 00	\$377 00	\$332 00
Deduct for Sons of Ministers, <i>et al.</i> , in Classical Course.....	.....	.....	100 00
			\$232 00
Deduct for same in other courses. .	.....	.....	\$50 00
			\$282 00
Lowest charges for nec- } Classical. .	.....	.....	\$232 00
essary expenses. } Technical. .	.....	.....	282 00

Laboratory fees and damage assessment, which vary in amount, must also be added, while the personal expenses for clothing, etc., must be estimated according to individual experience. The first year will be made more expensive by the fees for registration and matriculation, and furnishings for room; \$300 will therefore be a small allowance.

Parents and guardians at a distance may deposit funds with some member of the Faculty, who will pay particular attention to the pecuniary concerns of the student, settling his bills, and transmitting an account of the expenditure, for which services he will charge a commission. It is strongly recommended that parents furnish their sons with little beyond what will meet their necessary expenses.

BEQUESTS AND DEVISES.

Each State has special statutory regulations in regard to wills, and it is most important that all testamentary papers be signed, witnessed, and executed in all other respects according to the laws of the State in which the testator resides. In all cases, however, the name of the corporation must be accurately given, as in the following forms:

I give, devise, and bequeath to "The Trustees of Lafayette College," in Easton, Pennsylvania their successors and assigns forever, the sum of.....dollars, to be invested by said corporation in good real estate security, and the interest accruing therefrom to be applied to the support of the Professors in said College.

I give, devise, and bequeath a certain lot situated, etc., to "The Trustees of Lafayette College," in Easton, Pennsylvania, and to their successors and assigns forever, for the uses and purposes of said College, according to the provisions of its charter.

PRIZES.

The following prizes are offered annually:

THE FRANCIS A. MARCH PRIZE IN ENGLISH.

A prize of thirty dollars in books was given from 1862 to 1881 by the late Rev. William C. Fowler, LL D., of Durham, Connecticut, and since 1881 has been continued by Henry A. Potter, M.S., Class of '77, of New York, under the title of "The Francis A. March Prize," upon the following conditions:

"A committee of at least three shall be chosen by the Faculty to determine which student of the Senior Class has made the greatest proficiency in English Philology.

"The decision of the committee is to be made after attending an examination in some English classic, conducted by the Professor in English, and after reading essays written by the several members of the class, which shall contain a discussion of the language of some English classic."

The subject in 1908 will be the works of Shakespeare.

THE ASTRONOMICAL PRIZE.

A prize of thirty dollars in gold is awarded to the student making the greatest progress in the study of Astronomy in the Senior year.

MATHEMATICAL PRIZES

Two prizes of the value of twenty dollars each are offered in the Department of Mathematics to those students of the Junior Class, one in the Classical and general courses of the Scientific Department, and one in the Technical Departments, who shall have exhibited during the first two years of the course the greatest proficiency in the study of Mathematics.

These prizes were founded, as was the astronomical prize above-mentioned, in 1867, by Professor Traill Green, M.D., LL.D.

THE LOUNSBURY PRIZE IN CHAUCER.

A prize, consisting of books, is given to that student of the Sophomore Class who shall present the best essay upon some one of the works of Chaucer. This prize was given in 1896 by Thomas R. Lounsbury, Professor of English at Yale University, and will be continued by friends of the College as the Lounsbury Prize in Chaucer.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE.

A prize, consisting of books of the Early English Text Society, of London, is given to that student of the Junior Class who shall at the close of the Junior year pass the best examination in "English before Chaucer." The examination is based upon selected texts announced from year to year, which in 1908 will be from Caedmon.

This prize was founded in 1871.

THE CLASS OF '83 PRIZE.

A prize of the value of fifteen dollars is annually awarded to that member of the Sophomore Class who shall have attained the highest standing in his division of the class in Trench on The Study of Words.

This prize was founded by the Class of 1883 at their graduation.

COLEMAN BIBLICAL PRIZES.

Three prizes, each of the value of twenty dollars, are awarded

to those students of the Freshman Class who have attained the highest standing in the several divisions of Biblical study in that year.

These prizes were founded by the Rev. Lyman Coleman, D D., in 1880.

PRIZES IN ORATORY.

The Washington and Franklin Literary Societies appropriate one hundred dollars a year for prizes in oratory. Four contestants are chosen from each Hall to take part in the Junior Oratorical Contest, which is held in May. In the presence of a public audience three Judges, approved by the Faculty, hear the speakers and award the prizes. Their decision is based on the merits of the performances as to originality and force, with reference both to composition and delivery. The first prize is fifty dollars, the second prize thirty dollars, and the third prize twenty dollars.

PRIZES IN DEBATE.

Three prizes, of the total value of fifty dollars, are awarded to the successful competitors in a Senior contest in debate, held on Washington's Birthday in each year, between three contestants from each of the literary societies, chosen by a competitive debate in each society prior to December 1st in the previous year. The amount of the prizes and the conditions of the award are similar to the Junior Oratorical Contest. The first of these contests was held in 1894. The subject for debate in 1908 is:

RESOLVED, "*That the Interstate Commerce Commission has exercised powers not conferred upon the national government and injurious to the business interests of the country.*"

CIVIL ENGINEERING PRIZE.

A prize of the value of fifty dollars, the gift of Carroll Phillips Bassett, C.E., Ph.D., of the Class of 1883, is annually awarded to that member of the graduating class who presents the best graduating thesis and attains the highest standard of scholarship in the Civil Engineering Course.

THE PARK PRIZE IN LATIN.

A prize of fifteen dollars for the Latin Department has recently been founded by Mr. Samuel R. Park, A.M., '84. In 1908 it will

be awarded, on the work of the second and third terms Freshman Class, for excellence in Horace.

HISTORICAL ESSAY PRIZE.

A prize consisting of a copy of his work, "*The Marquis de Lafayette in the American Revolution*," is given annually by Charlemagne Tower, Jr., LL.D., of Philadelphia, United States Minister to Germany, to that member of the Senior Class who shall, on or before the first day of October, present the best essay on some subject connected with the relations of *France and the United States*. The essays must not exceed three thousand words in length. The subject for the year 1908 is: "*The value of the French Alliance in the American Revolution*."

THE CHEMICAL ESSAY PRIZES.

A prize of five dollars in books is awarded each term to that member of the Junior or Senior Class who shall present the best term theme on some Chemical subject.

THE GILBERT PRIZE IN OLD ENGLISH.

By the will of Howard Worcester Gilbert, who died in Chester County, March 5th, 1895, a bequest was left to the College, with the provision that a gold medal of the value of forty dollars should be awarded every two years to the student writing the best essay on the Old English Language and Literature, beginning with Beowulf, in the earliest Anglo-Saxon period, and extending down to the year 1070. Should the competitors be of equal merit, preference is to be given to residents of Pennsylvania.

The medal is an inch and three-fourths broad, three-sixteenths of an inch thick, and contains on its face a relief portrait of King Alfred, with the date 871-901, surmounted by the Anglo-Saxon phrase, "Naes he gold hwaete." The reverse shows a garland encircled with the legend, 'Howard Worcester Gilbert Old English Prize. Founded 1895.' Space is left for the name of the recipient.

This prize will be awarded at the Commencement of 1908. It is open to competition of students of Anglo-Saxon in the graduate courses of 1906-'07 and 1908-'09. The essay must be handed in by May 1st, 1908.

'85 PRIZE IN PHYSICS.

The Class of 1885 founded a prize in 1897 in the sum of \$500,

the annual income of which is given to that member of the Junior Class who attains the highest rank in the studies of Mechanics and Physics.

THE BLOOMBERGH PRIZE.

The Class of 1888 at its Decennial Reunion subscribed the sum of \$500, the annual income of which is awarded to that member of the Junior Class who shall attain the greatest proficiency in the study of the French and German languages and their literatures.

THE B. F. BARGE GOLD MEDAL.

A prize of a gold medal of the value of \$100 was founded by Benjamin F. Barge, Esq., of Mauch Chunk, Pa., to be awarded to that member of the Senior Class who shall deliver the best oration in an annual contest to be held on Memorial Day, May 30th. The contestants, not more than six in number, are to be chosen by a committee of the Faculty from those members of the Senior Class, who shall hand in orations on or before May 1st upon topics assigned by the committee not later than March 15th of each year.

BARGE MATHEMATICAL PRIZES.

By the bequest of the late Benjamin F. Barge, Esq., of Mauch Chunk, three prizes have been established for excellence in mathematical studies. These prizes will be awarded to members of the Sophomore Class for excellence in the solution of original problems

THE R. B. YOUNGMAN GREEK PRIZE.

The Class of 1884, at its vigintennial reunion, subscribed the sum of \$500, the income of which is to be awarded to that member of the Sophomore Class who shall attain the greatest proficiency in Greek.

THE NEW SHAKSPERE SOCIETY'S PRIZE.

A prize of books is awarded to that member of the Junior Class who passes the best general examination upon Shakspeare, his works, life, character, etc.

NOTE.—In all cases where a prize is awarded to an essay or oration the successful competitor must hand to the proper authority two typewritten copies of his production before receiving the prize, if he is requested to do so.

RECENT ADDITIONS.

THE DEPARTMENT OF MINING ENGINEERING AND GRAPHICS has received Magneto-electric Battery for Firing Blasts from the Macbeth Fuze Works; Three Acetylene Mine Lamps from F. E. Baldwin M'f'g Co., New York; Drawing and Data Descriptive of the Mesabi Iron Mines in Minnesota, from F. W. Uhler, '06; Pictures Showing Diamond Drilling Operations, from L. G. Bradley, '04.

THE DEPARTMENT OF CHEMISTRY AND METALLURGY has received Samples of Chemicals and Minerals from the General Chemical Co., the Baker & Adamson Co., E. G. Acheson, Niagara Falls, N. Y., W. E. Shaeffer, '08, Cassella Color Co., Farbenfabriken of Elberfeld Co., Tantalum Lamp from R. C. Nash, '11.

DEGREES CONFERRED.

HONORARY DEGREES.

June 19, 1907—Seventy-fifth Anniversary.

DOCTOR OF LAWS.—Hon. Edwin Sydney Stuart, Governor of Pennsylvania; Hon. Charles Evans Hughes, Governor of New York; Hon. Henry Wyatt Scott, '67, President Judge of the Third Judicial District of Pennsylvania. Hon. William Plumer Potter, '79, Harrisburg, Pa., Justice of the Supreme Court of Pennsylvania; Hon. Aaron Snyder Swartz, '71, Norristown, President Judge of the Thirty-eighth Judicial District of Pennsylvania; Rev. John Grier Hibben, Ph.D., Stuart Professor of Logic, Princeton University; James McKeen Cattell, Ph.D., '80, Professor of Psychology, Columbia University; Edward Williams Morley, LL.D., Sometime Professor of Chemistry, Western Reserve University.

DOCTOR OF DIVINITY.—Rev. William Henry Roberts, D.D., LL.D., Philadelphia, Pa., Moderator General Assembly Presbyterian Church; Rev. William Wilberforce Heberton, '65, Presbyterian Board of Ministerial Relief, Philadelphia; Rev. Frank Herring Chalfant, '81, Weihsien, China, author of "Early Chinese Writing." Rev. Rufus Wilder Miller '83, Sunday School Board Reformed Church, Philadelphia; Rev. Albert James Weisley, '91, Third Presbyterian Church, Trenton, N. J.; Rev. Joseph H. Odell, Second Presbyterian Church, Scranton, Pa.; Rev. Alexander J. Kerr,

Memorial Church, Wilkes-Barre, Pa.; Rev. James H. Owens, East Side Presbyterian Church, Paterson, N. J.

DOCTOR OF LITERATURE.—James Wilson Bright, Ph.D., '77, Professor of English Philology, Johns Hopkins University; Charles Payson Gurley Scott, Ph.D., '78, New York, N. Y.; Hugo Münsterberg, M.D., Ph.D., LL.D., Profesor Psychology, Harvard University.

DOCTOR OF SCIENCE.—Frederick Starr, Ph.D., '82, Professor of Anthropology, University of Chicago; Judson Perry Welsh, '82, Vice-President Pennsylvania State College; Henry Snyder, '78, President Board of Education, Jersey City, N. J.; Amory Prescott Folwell, Editor of the Municipal Journal and Engineer, New York, N. Y.

MASTER OF ARTS.—Richard William Dickinson Bryan, '70, Albuquerque, New Mexico; Francis Ransom Lane, M.D., Director Jacob Tome Institute, Port Deposit, Md.; Elmer Ellsworth McAdoo, M.D., '84, Ligonier, Pa.; John Leavitt Griggs, '98, Paterson, N. J.

October 23, 1908.

DOCTOR OF LAWS.—Le Baron Russell Briggs, A.M., LL.D., of Harvard University; J. George Becht, '90, Principal Clarion State Normal School.

DEGREES IN COURSE.

June 19, 1907.

BACHELOR OF ARTS.—W. C. Alexander, Jr., D. C.; F. R. Bacon, N. J.; R. T. Barrett, N. Y.; E. W. Coffin, Pa.; H. E. Diehl, Pa.; W. C. Dutot, Pa.; C. J. Fingar, N. Y.; E. C. Gilland, Pa.; J. H. Hand, Pa.; R. S. Hemingway, Pa.; J. S. Illick, Pa.; W. E. Kiefer, Pa.; H. L. MacAskie, Pa.; W. C. Perez, N. J.; F. L. Sherrer, Pa.; B. B. Smith, VI., Pa.; H. D. Smith, N. J.; H. B. Thomas, Pa.; H. C. Updegrave, Pa.; W. S. Welsh, Pa.; L. H. Wilde, N. J.; E. G. Wilson, Pa. Total, 22.

BACHELOR OF PHILOSOPHY.—O. W. Ackerman, Pa.; A. C. Boyce, Ill.; T. H. Gilland, Pa.; D. W. Griffiths, Pa.; W. B. Hawk, N. J.; F. H. Hennessy, N. J.; J. R. Hess, N. J.; P. K. Holgate, Pa.; Z. R. Howell, Pa.; C. D. McClary, Jr., N. J.; F. R. Shafer, Pa.; E. L. Smith, N. J.; F. A. Souders, N. J.; R. M. Teel, N. J.; J. H. Vandersdale, N. Y.; R. S. Williams, Pa. Total, 16.

BACHELOR OF SCIENCE IN CHEMISTRY.—H. C. Hottel, N. J.; S. C. Straub, Pa. Total, 2.

BACHELOR OF SCIENCE.—E. A. Robertson. Total, 1.

CIVIL ENGINEER.—T. H. Acker, D. C.; C. R. Anderson, N. J.; J. Barberey, Pa.; J. A. Darsie, Pa.; M. D. Ewell, N. Y.; E. D. Flad, Pa.; J. L. Freeman, Pa.; R. V. Glover, Pa.; J. A. Hamilton, Pa.; W. V. Hetchie, Pa.; A. A. Johnson, Pa.; F. S. Johnson, Pa.; C. T. Kimble, Md.; C. A. Miller, Conn.; T. Osborn, N. Y.; C. E. St. John, Pa.; J. M. Silliman, Pa.; H. Snook, N. J.; W. Springer, Jr., Del.; M. Stevenson, N. J.; C. E. Stiver, Pa.; W. R. Tapscott, Pa.; J. M. Thomas, Pa.; D. B. Woolcock, Pa. Total, 24.

ELECTRICAL ENGINEER.—J. P. Alexander, Pa.; N. J. Dicks, Pa.; R. T. Lerch, Pa.; J. D. Lewis, N. Y.; H. A. Logan, Pa.; R. C. McComb, N. J.; D. W. Snyder, Jr., Pa. Total, 7.

MINING ENGINEER.—W. F. Evans, Pa.; T. B. Silliman, Pa. Total, 2.

Total—First Degree, 74.

COMMENCEMENT DISTINCTIONS, 1907.

HONORS.—Harold Edgar Diehl, Easton (Latin Salutatory); Harvey Claude Updegrave, Easton (Valedictory).

ORATIONS.—Oscar Wilson Ackerman, Ackermanville; William Clarke Alexander, Jr., Washington, D. C.; Frank Rockwood Bacon, Bridgeton, N. J.; Arthur Clifton Boyce, Tuscola, Ill.; Norman J. Dicks, West Chester; Mark Dee Ewell, Wyoming, N. Y.; John Royden Hess, Phillipsburg, N. J. (Scientific); Chester Tome Kimble, Port Deposit, Md.; Rush Tilgham Lerch, Easton; Charles Edward St. John, Scranton (Engineering).

Justice Mitchell Silliman, Easton; Thomas Boughton Silliman, Easton; Daniel Webster Snyder, Jr., Easton; Frank Arndt Souders, Phillipsburg, N. J.; Samuel Christian Straub, Easton; Howard Bingham Thomas, Easton; Frederick Sager Welsh, Bloomsburg; Edmund Graham Wilson, West Philadelphia.

PRIZES AWARDED.

SENIOR PRIZEMEN.

THE FRANCIS A. MARCH PHILOLOGICAL PRIZE: Edward W. Coffin, Easton.

THE ASTRONOMICAL PRIZE: Charles E. St. John, Scranton.

THE BASSETT PRIZE IN CIVIL ENGINEERING: Divided equally between Charles E. St. John, Scranton, and Thomas Osborn, Wain-scott, N. Y.

SENIOR DEBATE.

QUESTION: *Resolved, That the increase of naval armament is an unnecessary burden and a menace to the peace of the world.*

SPEAKERS.

Washington Hall.

Frank R. Bacon, *negative*.

David W. Griffiths, *negative*.

Frank H. Hennessy, *negative*.

Franklin Hall.

William C. Perez, *affirmative*.

Bela Buck Smith, VI., *affirmative*.

Howard B. Thomas, *affirmative*.

FIRST PRIZE: Frank H. Hennessy, Haworth, N. J.

SECOND PRIZE: Bela Buck Smith, VI., Belle Vernon.

THIRD PRIZE: David W. Griffiths, Wilkes-Barre.

B. F. BARGE GOLD MEDAL: W. C. Perez, Camden.

THE CHEMICAL ESSAY PRIZES (Junior or Senior): Louis C. Chandler, Scranton.

THE HALL PRIZES OF THE AMERICAN INSTITUTE OF CIVICS: Frank H. Hennessy, Haworth, N. J.; Bela Buck Smith, VI., Belle Vernon; Howard B. Thomas, Easton.

JUNIOR PRIZEMEN.

THE MATHEMATICAL PRIZES:

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE: Edward W. Coffin, Easton.

THE NEW SHAKSPERE SOCIETY'S PRIZE: Harold D. Smith, Phillipsburg, N. J.

BLOOMBERGH PRIZE: Clinton J. Ruch, Nathaniel Jacobs.

JUNIOR ORATORICAL PRIZES.

Contest May 15th, 1905.

SPEAKERS.

Franklin Hall.

Donald M. Kirkpatrick,

Carlton S. McHenry,

Francis P. O'Brien,

Clinton J. Ruch.

Washington Hall.

David R. Evans,

Augustus S. Hutchison,

Clarence D. Long,

Arthur W. Sullivan.

FIRST PRIZE: Carlton S. McHenry, Danville, Pa.

SECOND PRIZE: Arthur W. Sullivan, Oak Park, Ill.

THIRD PRIZE: Clinton J. Ruch, Hellertown, Pa.

THE CLASS OF '85 PRIZE IN PHYSICS: Clinton J. Ruch, Hellertown, Pa.

THE BLOOMBERGH PRIZE IN MODERN LANGUAGES: Frank R. Bacon, Bridgeton, N. J., and Willard Springer, Wilmington, Del.

SOPHOMORE PRIZEMEN.

THE LOUNSBURY PRIZE IN CHAUCER: Augustus S. Hutchison, Belvidere, N. J.

CLASS OF '83 ENGLISH PRIZE: Miller D. Steever, Irvin J. Shafer, Reading.

THE BARGE MATHEMATICAL PRIZES: Lasley Lee, H. K. Preston, Richard Johanknecht.

TRAILL GREEN MATHEMATICAL PRIZE: Irvin J. Shafer, Reading; William H. Hartzell.

FRESHMAN PRIZEMEN.

LYMAN COLEMAN BIBLICAL PRIZES.

SECTION A: John H. Dalrymple.

SECTION B: Arthur E. Keiber.

SECTION C: Stewart R. Race.

THE PARK PRIZE IN LATIN: Philip A. Swartz, Poughkeepsie.

THE R. B. YOUNGMAN GREEK PRIZE: Irvin J. Shafer, Reading, Pa.

CLASS MONITORS.

Appointed for general excellence in study:

SENIOR CLASS: C. J. Ruch.

JUNIOR CLASS: D. E. Edwards.

SOPHOMORE CLASS: P. A. Swartz.

FRESHMAN CLASS: C. E. Feick and C. B. Swartz.

Theses presented by Candidates for Degrees in the Technical Courses of the Pardee Scientific Department.

June 19, 1907.

1. Graphic Oxid.

HOWARD CLIFFORD HOTTEL, Trenton, N. J.

SAMUEL CHRISTIAN STRAUB, Easton.

2. The Testing of Rail Bonds
JAMES PATTERSON ALEXANDER, Hollidaysburg.
3. Construction of Wireless Telegraph Apparatus.
NORMAN JAY DICKS, West Chester.
RUSH TILGHAM LERCH, Easton.
4. Study of the Wave Form of Alternating Currents.
JACOB DANIEL LEWIS, Elmira, N. Y.
ROBERT COOPER McCOMB, Haddonfield, N. J.
5. Testing of the Power Plant and the Equipment of the Northampton Traction Company.
HARRY ARTHUR LOGAN, Scranton.
DANIEL WEBSTER SNYDER, Jr., Easton.
6. Effect of Heat on Cement Mortar.
MARKLEY STEVENSON, Camden, N. J.
CHRISTIAN EARLE STIVER, Nazareth.
7. The Effect of Fineness on the Tensile Strength of Cement Mortar.
JOHN BARBEREY, Easton.
8. Holding Force of Lag Screws.
CHESTER TOME KIMBLE, Port Deposit, Md.
CLYDE AUSTIN MILLER, Waterbury, Conn.
9. The Effect of Oil on the Transverse Strength of Timber.
THOMAS HOSKINSON ACKER, Washington, D. C.
ROBERT VAN VALZAH GLOVER, Mifflinburg.
10. Investigation of the Efficiency of the Filter Plant at Norristown, Pa.
WILLIAM VICARY HETCHIE, Freedom.
JOHN LEON FREEMAN, Norristown.
11. The Disposal of the Refuse of the City of New York.
WILLIAM ROWLAND TAPSCOTT, Easton.
12. The Effect of Oil on the Crushing Strength of Timber.
WILLARD SPRINGER, JR., Wilmington, Del.
DANIEL BARLOW WOOLCOCK, New Castle.
13. Comparative Tests of Road Materials.
THOMAS OSBORN, Wainscott, N. Y.
CHARLES EDWARD ST. JOHN, Scranton.
14. Modulus of Elasticity of Cement Mortars.
JOHN ANDREW HAMILTON, Mercer.
ALBERT ALONZO JOHNSON, Covington.

15. The Use of Caissons in the Construction of the Church Street Terminal, New York City.
JAMES ALGERNON DARSIE, Pittsburg.
JUSTUS MITCHELL SILLIMAN, Easton.
16. Shearing Strength of Cement Mortar.
CHARLES ROBBINS ANDERSON, Bloomsbury, N. J.
HARVEY SNOOK, Branchville, N. J.
17. Crushing and Absorption Test of Paving Brick.
FRANK SIMON JOHNSON, Easton.
MARK DEE EWELL, Wyoming, N. Y.
18. Transverse and Abrasion Tests of Paving Brick.
EDWARD DIETRICH FLAD, Easton.
JOHN MILTON THOMAS, Edwardsdale.
19. Iron Ore Mining at Hibbing, Minn.
THOMAS BOUGHTON SILLIMAN, Easton.
20. Review of Shaft Sinking Operations at Franklin Furnace.
WALTER FRENCH EVANS, Beaver.

THE ALUMNI ASSOCIATION.

The Alumni Association is composed of Graduates of the College and such former students as left College before graduation, in good standing, as may be elected. The annual meeting is held on Tuesday preceding Commencement Day.

The Association has the privilege of choosing six members of the Board of Trustees, who hold office for six years. In June, 1906, William McMurtrie, Ph.D., '71, of New York City, and Andrew F. Derr, '75, of Wilkes-Barre, were chosen. In the spring of 1908 two more will be voted for.

The Executive Committee is as follows: McCluney Radcliffe, M.D., '77, Chairman, Philadelphia; Fred R. Drake, '86, Easton; James W. Fox, '88, Easton; Joseph R. Shimer, '73, Phillipsburg, N. J.; Hunter Eckert, '83, Reading; William M. Michler, '93, Easton.

It is desirable to keep up the full record, so long maintained, of the residences, occupations, literary efforts, and public services of the alumni and former students of the College.

Information is solicited in regard to these points, and also in

reference to matters appropriate to the obituary record, which is annually prepared for the Alumni Association.

Each Alumnus is asked to send his personal record, carefully revised to date, to the Secretary before May 1, 1908.

ALUMNI ASSOCIATION OF LAFAYETTE.

CASPER DULL, '77, Harrisburg.....*President.*
J. EDWARD DURHAM, '78, Philadelphia.....*Vice-President.*
REV. J. F. STONECIPHER, D.D., '74, Easton..*Sec. and Treasurer.*

LOCAL ASSOCIATIONS.

THE LAFAYETTE ALUMNI ASSOCIATION OF NORTH-EASTERN PENNSYLVANIA.

ROBERT PECK, '93, Scranton.....*President.*
LOUIS M. LARNED, '04, Wilkes-Barre.....*Secretary.*

THE LAFAYETTE ALUMNI ASSOCIATION OF PHILADELPHIA AND VICINITY.

HENRY W. CATTELL, M. D., '83, Philadelphia.....*President.*
CHARLES B. ADAMSON, 210 Chestnut Street, Phila.*Secretary.*

THE LAFAYETTE ALUMNI ASSOCIATION OF NEW YORK AND VICINITY.

JOHN MARKLE, '80, New York.....*President.*
JOHN F. VALIENT, '99, 5 Nassau Street, New York.....*Secretary.*

THE LAFAYETTE ALUMNI ASSOCIATION OF THE WEST BRANCH.

FRED H. PAYNE, '88, Williamsport.....*President.*
R. FLEMING ALLEN, '90, Williamsport.....*Secretary.*

THE LAFAYETTE ALUMNI ASSOCIATION OF CENTRAL PENNSYLVANIA.

REV. A. N. HAGERTY, '81, Carlisle.....*Secretary.*

THE LAFAYETTE ALUMNI ASSOCIATION OF WESTERN PENNSYLVANIA.

SIMON CAMERON LONG, '77, 43d Street, Pittsburg.....*President.*
JOHN F. TIM, '01, 1205 Berger Bldg., Pittsburg.....*Secretary.*

THE LAFAYETTE ALUMNI ASSOCIATION OF MARYLAND.

ROBERT H. SMITH, '67, 53 St. Paul Street, Baltimore...*President.*PEARCE KINTZING, M.D., '81, Baltimore.....*Secretary.*THE LAFAYETTE ALUMNI ASSOCIATION OF CHICAGO
AND VICINITY.W. F. JOHNSON, '91, Chicago.....*President.*L. F. GATES, '97, 378 Wabash Ave., Chicago.....*Secretary.*THE LAFAYETTE ALUMNI ASSOCIATION OF THE NORTH-
WEST.REV. GEO. C. POLLOCK, D.D., '61, Litchfield, Minn.....*President*HON. JAMES T. HALE, '77, Duluth, Minn.....*Secretary.*THE LAFAYETTE ALUMNI ASSOCIATION OF WASHING-
TON, D. C.JAMES F. R. APPLEBY, M.D. '64, Georgetown.....*President.*SNOWDEN ASHFORD, '88, 918 Farragut Square.....*Secretary.*THE LAFAYETTE ALUMNI ASSOCIATION OF NEW JER-
SEY.G. W. W. PORTER, '85, Newark, N. J.....*President.*

JOSEPH O. SKINNER, '02, 164 Market Street, Newark,

N. J.....*Secretary.*

ASSOCIATION OF ST. LOUIS AND THE SOUTHWEST.

REV. C. L. CHALFANT, '89, St. Louis.....*President.*H. P. G. COATES, '92, St. Louis.....*Secretary.*

JUNIOR ALUMNI ASSOCIATION OF EASTON.

C. F. OLDT, '00, Easton.....*President.*H. B. MOON, '99.....*Secretary.*

STUDENTS.

GRADUATE STUDENTS.

S. B. Gilhuly, A.M., N. J.	History and English Literature,	Lafayette, '86.
J. B. Hench, A.M., Pa.	Latin,	Lafayette, '83.
A. Roberts. Ph.B., M.S., Pa. . . .	History and Political Science,	Lafayette, '99.
C. F. F. Garis, Ph.B., Pa.	Mathematics and German,	Lafayette, '03.
E. F. Farquhar A.B., Pa.	English and Philology,	Lafayette, '05.
C. F. Pfatteicher, A.B., Pa.	Philosophy and English Literature	Lafayette, '03.
W. M. Smith, Ph.B., Pa.	Mathematics and Astronomy,	Lafayette, '03.
J. W. Colliton. C. E., Pa.	Mining Engineering,	Lafayette, '06.
William H. Kirkpatrick, A.B., Pa. .	History and Political Science,	Lafayette, '05
Carmon Ross, Ph.B., Pa.	Modern Languages,	Lafayette, '05.
Rev. Scott R. Wagner, A.M. . . .	Philosophy,	Franklin and Marshall, '97.
Glenn C. Heller, A.M.	Philosophy,	Franklin and Marshall, '98.

GRADUATES. 12

SENIOR CLASS, 1908.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Charles Elwood Albert.	C. E. . . .	Pen Argyl.	44 S.
Charles Lupfer Albert.	C.	Bloomsburg.	68 B.
Donald Budd Armstrong.	L.	Easton. 209 Northampton.	
Thomas Ellison Arnold.	Ch.	Pen Argyl.	44 S.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Benjamin Mernard Aycrigg	C. E.	Walden, N. Y.	77 K.
Howard Benjamin Bartolet	C.	Lehighton	46 S.
Wesley Nathaniel Boyer†	C. E.	Weissport	162 E.
Roie Smith Bristol	C. E.	Lima, N. Y.	22 S.
Floyd Ambrose Brotzman	L.	Easton. 740	Wilkes-Barre.
Henry Lewis Buckley	C.	Easton	28 N. 3d.
Martin Burns Buckley	C. E.	Boston, Mass.	838 Wolf St.
John W. Caswell	E. M.	Lime Hill	37 S.
Louis Charles Chandler	Ch.	Scranton	102 McK.
William Warren Craig	L.	New Germantown, N. J., O. Brd.	
Wade Hampton Davidson	C.	Junction, N. J.	Home.
William George Davis	C.	Easton	428 Berwick.
George Oliver Deshler	E. M.	Bangor	79 N.
Elias Doremus	C. E.	Gladstone, N. J.	34 S.
Wallace Bruce Drinkhouse†	L.	Easton 247	Spring Garden.
Charles Roy Ellicott	Ch.	Easton	Beth. Road.
James Wilson Rhoades Engle	C.	Hazleton	T. D. Chi.
David Reese Evans	C.	Plymouth	Brd.
William Josiah Fetter	C.	Landisburg	81 N.
Erle Leighton Flad	E. M.	Easton	802 Cattell.
Charles James Folk	C. E.	Phillipsburg, N. J., 62 Lewis St.	
Julius Freund	E. M.	Honesdale	145 P.
Leo Alvin Gates	C.	Hornell, N. Y.	63 B.
Raymond Lewis Gebhardt	C. E.	Easton	25 S. 13th.
John William Giles	E. E.	Phillipsburg, N. J., 257 Washington.	
Charles Edmund Gilmore	C.	Williamsport	D. K. E.
Henry Green	Ch.	Easton Cor.	Pierce and McC.
Silas Maxwell Haight	C. E.	Elmira, N. Y.	150 P.
David Lyman Harstine	L.	Ferndale	32 S.
William Alonzo Hauck	E. M.	Easton 1044	Northampton.
Clarence Alexander Hensey	G. S.	Washington, D. C.	140 F.
Harry Moore Hirst	E. M.	Lansdowne	121 McK.
Francis Michael Howard	E. M.	Duquesne	131 M.
Thomas Lawrence Howard	E. M.	Duquesne	131 M.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Augustus Seeley Hutchison..	L.....	Belvidere, N. J..	106 McK.
William Lewis Jackson.....	Ch.....	Chester, N. Y.....	72 B.
Nathaniel Jacobs.....	L.....	Plymouth.....	22 S.
Harry Dill Kinney.....	E. M...	Easton.....	T. D. Chi.
Donald Morris Kirkpatrick..	C.....	Easton.....	123 Reeder.
Paul Howard Kleinhans....	L.....	Easton.....	R. F. D. 1.
George Albert Koerber.....	E. E...	Hazleton.....	149 P.
Eltinge Silkman La Bar.....	E. E...	Scranton.....	D. K. E.
Harry George Lee.....	C. E...	East Orange, N. J.	132 M.
Robert Lorne Logan.....	L.....	Oil City.....	Sigma Chi.
Clarence Dickison Long.....	L.....	Traymore.....	149 P.
Hobson Thomas Long†.....	C.....	Philadelphia.....	83 N.
William James MacAvoy.....	C. E...	Hazleton.. Clinton and McC.	
Russell Atcheson McCachran..	C. E...	Newville.....	90 N.
Carlton Shelhart McHenry....	L.....	Danville.....	82 N.
Harry Maue.....	C. E...	Hazleton.....	19 S.
Charles Pomp Maxwell.....	C.....	Easton, 14 Chestnut Terrace.	
Wilson Isaac Miller.....	C.....	Easton....	315 McKean St.
Arthur Clemens Morgenstern..	C. E...	Easton.....	Home.
Henry Clay Mutchler†.....	C. E...	Easton.....	829 Ferry.
Louis W. Myers†.....	G. S...	Closter, N. J....	Sigma Chi.
Francis Paul O'Brien.....	C.....	Wilkes-Barre.....	38 S.
Walter Gray Peters.....	E. E...	Bushkill.....	D. K. E.
Anson Samuel Pollock.....	E. M...	Antrim.....	146 P.
Robert Liddle Porter.....	E. M...	Clearfield.....	75 K.
Charles Nelson Reading, Jr....	C. E...	Frenchtown, N. J.	137 F.
Halsey Darius Rogers.....	C. E...	West Hampton Beach, N. Y.	132 M.
Clinton Joseph Ruch.....	C.....	Hellertown..	46 S.
Earl Clifford Sandt.....	Ch.....	Easton.....	221 McCartney.
Henry Karl Sangree.....	C.....	Easton.....	138 Bushkill.
James Kenneth Satchell....	Ch.....	Easton.....	42 S. 2d.
Harry August Schmidt.....	C. E...	Brooklyn, N. Y....	138 F.
Elmer Bonnell Severs.....	E. E...	Philadelphia.....	95 McK.
George Nash Shaeffer.....	Ch.....	Lockport, N. Y.	T. D. Chi.
Samuel Hawley Sherrerd, C. E. E. E.	E. E...	Easton.....	T. D. Chi.
Aaron Boyer Shimer.....	C. E...	Easton, 15th and Washington	

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM
James Howard Smith.....	C.....	Berwick.....	147 P.
Roscoe Lee Smith.....	C. E....	Berwick.....	147 P.
Oliver Smith Styer.....	C. E....	Burlington, N. J....	89 N.
Arthur White Sullivan.....	L.....	Oak Park, Ill....	T. D. Chi.
Francis William Sullivan.....	L.....	Oak Park, Ill....	T. D. Chi.
Luther Ross Turner.....	C.....	Westgrove.....	103 McK.
Eugene Henry Uhler.....	C. E....	Stockertown.....	Home.
Ellis Whitfield Wade.....	E. E....	Hackettstown, N. J.,	88 N.
John Howell West.....	L.....	Easton.....	26 S. 5th.
Richard Samuel Whitesell	C.....	Easton.....	700 Walnut.
John Forest Williams.....	C.....	Martin's Ferry, O....	101 McK.
Cyrus Hamlin Williston.....	Ch.....	Phillipsburg, N. J.,	609 S. Main.
Henry Tissington Wootton....	E. E....	Boonton, N. J....	99 McK.
Samuel Duncan Wylie.....	C.....	Shippensburg....	113 McK.
SENIORS.....			88

JUNIOR CLASS, 1909.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Otis Tiffany Barnes.....	C.....	Philadelphia.....	D. K. E.
Howard James Bell.....	C.....	Auburn, N. Y.....	64 B.
Remsen Du Bois Bird.....	C.....	Rondout, N. Y.....	85 N.
Harold McDaniel Brown†.....	G. S...	Elizabeth, N. J.....	140 F.
William Eustis Brown.....	L.....	Boonton, N. J.....	170 E.
Marvin Clarence Carter.....	Ch.....	Scranton.....	102 McK.
Harold Russell Chidsey.....	C.....	Easton.....	Home.
William Walker Darsie†.....	E. M...	Pittsburg.....	T. D. Chi.
Frank Berlin Davenport.....	C. E...	Wilkes-Barre.....	109 McK.
Harry Gardner DeWitt.....	C. E...	Scranton.....	142 P.
Lincoln Cook Dodge.....	C. E...	Hazleton.....	88 N.
David Reed Edwards.....	C.....	Chatham, N. J.....	39 S.
Clarence Edward Fee.....	L.....	Bremen, Germany	114 McK.
Howard Walker Fields.....	C. E...	Media.....	115 McK.
Claude Hughes Folkenson†.....	E. E...	Easton.....	—
Nathaniel Rue Foster.....	C.....	Imlaystown.....	105 McK.
Frank Andrew Gehr.....	C.....	Greensburg.....	91 McK.
John Wagener Green.....	C. E...	Easton.....	Pierce & McC.
William Henry Hartzell.....	C.....	Easton.....	R. F. D. 5.
Robert Harris Hutchison.....	C.....	Malvern.....	169 E.
Richard Johanknecht.....	C. E...	Rock Castle, Va.....	90 N.
Addison Leslie Jones.....	E. E...	Easton... 834	Northampton.
Robert Conrad Kay.....	G. S...	Pittsburg.....	D. K. E.
Mahlon Bunting Knowles.....	C. E...	Yardley.....	114 McK.
Walter John Kocher.....	C. E...	Easton.....	Bushkill.
Thomas Ridgway Lathrope...L.....		Carbondale.....	122 McK.
Joseph G. Lear, Jr.....	C.....	Lambertville, N. J...	25 S.
Frank Hill Lerch, Jr.....	Ch.....	Easton.....	Home.
William John McCandless.....	C.....	Phila.....	D. K. E.
Alvah Rufus McLaughlin....L.....		Dunmore.....	157 E.
Albert Ralph McMeen†.....	G. S...	Mifflin.....	121 McK.
Ellery Dolson Manley.....	L.....	Elmira, N. Y.....	T. D. Chi.
Charles Frederick Maxwell...C.....		Greensburg.....	92 McK.
Clifton Pool Mayfield.....	C. E...	Washington, D. C...	78 K.
Percy Ellwood Mebus.....	C. E...	Easton.....	119 S. 9th.
George Franklin Metz.....	E. E...	Hazleton.....	84 N.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Edward Archibald Mewhinney.	C.....	Easton.....	415 Valley.
Samuel John Mills.....	C.....	Chefoo, China.....	62 B.
Edward Corbin Moore.....	E. M...	Flushing, N. Y...	107 McK.
Harold Stephenson Newins....	L.....	Patchogue, N. Y.	113 McK.
John Allen Nightingale.....	L.....	Easton. 338 Spring Garden.	
Alvin Clyde Nolf.....	E. E...	Easton.....	241 Bushkill.
Joshua T. Paxson.....	C. E...	Dreshertown	65 B.
Howard Kent Preston.....	C. E...	Trenton, N. J.....	82 N.
Silas Swallow Riddle.....	C. E...	Bloomsburg.....	115 McK.
Elbert Ross.....	Ch.....	Bangor.....	84 N.
William Crosby Ross.....	C.....	Wilmington, Del.....	Brd.
Robert Amandus Sandt.....	E. E...	Easton.....	412 High.
Rollin Alger Sawyer, Jr.....	C.....	Harrisburg.....	122 McK.
Ralph Percy Schelly.....	Ch.....	Phillipsburg, N. J.,	
		80 S. Main.	
Adolph Philipp Schneider.....	E. E...	Honesdale.....	19 S.
Carl Frederick Schoen.....	Ch.....	Scranton.....	66 B.
Daniel Herbert Schweyer†.....	Sp.....	Easton... Monroe and McC.	
Irvin Jonathan Shafer.....	C.....	Reading.....	25 S.
Bert William Simpson.....	C.....	Chicago, Ill.....	161 E.
John Paul Snyder	Ch.....	Easton.....	126 N. 10th
Harry T. Spengler.....	C. E ..	Easton.....	Home.
Miller Didama Steever.....	L.....	Manila, Ph. Is.....	D. K. E.
Edgar Mark Troutfelt	L.....	Scranton.....	66 B.
George Franklin Walter.....	C. E...	Easton.....	R. F. D. 2.
Herbert Forrest Walter†.....	Ch.....	Easton.....	232 McCartney
Robert Stanley Walter.....	C.....	Easton. 4th and Bushkill,	
Francis Benjamin Watkins....	E. M...	Washington, D. C....	78 K.
Frank Happersett Wells, Jr...	L.....	Chester Springs....	105 McK.
Frederick Ernest Wheeler.....	C. E...	Easton.....	127 M.
Andrew Jackson Wight.....	C.....	Perth Amboy, N. J...	—
JUNIORS.....			66

SOPHOMORE CLASS, 1910.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
George Frederick Alrich.....	E. E...	Easton Lachenour Heights.	
Charles Eaton Anstett	E. E...	Easton.....	—
Paul Mitchell Arndt.....	E. E...	Phillipsburg, N. J.	3 Chambers.
George Calvin Baker.....	L.....	Noxen.....	173 E.
Edmund Affleck Beers.....	E. E...	Elmira, N. Y.	165 E.
Arthur Isaac Beilin.....	C. E...	Easton..	144 Northampton.
Arthur Augustus Blaicher.....	C. E...	Newark, N. J....	136 McC.
Robert Franklin Brown.....	C.....	Easton.....	R. F. D. 4
John Cawley.....	G. S...	Springtown.....	24 S.
Andrew Milton Chalmers†.....	E. M...	Des Moines, Ia.	138 F.
John Boyer Cline.....	E. E...	Stewartsville, N. J..	Home.
Herbert Terry Conklin†.....	C. E...	Patchogue, N. Y.	68 B.
Warren John Conrad.....	C.....	Reading.....	15 S.
Isidor Coons.....	L.....	Wilkes-Barre.....	94 McK.
Allen Craig.....	C. E...	Washington, D. C.	509 High.
Joseph Force Crater, Jr.....	C.....	Easton.....	5th and Ferry.
Wilson Crawford.....	E. E...	Summit Hill.....	71 B.
Paul Nelson Crispin.....	C. E...	Phillipsburg, N. J.,	94 So. Main.
Paul Edward Cunningham....	L.....	Pittsburg	—
Springer Lawrence Cuning-			
ham, Jr.....	E. E...	Pittsburg.....	139 F.
John Hart Dalrymple.....	C.....	West Orange, N. J..	47 S.
Joseph Benson Darlington....	Ch....	West Chester.....	D. K. E.
James Shackelford Dauerty...	C.....	Philadelphia.....	26 S.
Alvan Yost Deisroth.....	L.....	Hazleton.....	163 E.
Joseph Jay Durfee.....	C. E...	Covington, N. Y.	35 S.
Henry Wilmot Eckel.....	C. E...	Washington, N. J....	33 S.
William Thomas Edgell.....	E. E...	Wilkes-Barre.....	33 S.
Henry M. Edwards, Jr.†.....	C. E...	Scranton.....	148 P.
Chester Alexander Eichel-			
berger.....	C. E...	Everett.....	148 P.
Ralph Lawrence Ely.....	C.....	Allegheny.....	12 S.
Milton Rutherford Evans.....	E. M...	Plymouth.....	24 S.
William Moodie Evans†.....	C. E...	Syracuse, N. Y....	T. D. Chi.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Orville Crawford Fay.....	C.....	Hollidaysburg.....	127 M.
Reuben Frank Gies.....	Ch.....	Easton.....	129 S. 3rd.
William Fogg Goodwin.....	E. M....	Bridgeton, N. J.....	26 S.
Arthur Rand Gordon.....	E. M....	West Hampton, N. Y.,	172 E.
Jesse Grube.....	C. E....	Easton. 665 Spring Garden.	
John Milton Guthrie, Jr.....	C.....	Indiana.....	D. K. E.
Abram Packer Hays.....	L.....	Munhall.....	T. D. Chi.
Robert Black Herbert.....	C. E....	Greensburg.....	—
Frederick Herr.....	L.....	Flemington, N. J....	151 P.
Daniel Ackerman Herrick.....	L.....	Kingston, N. Y....	130 M.
Harold Wilbur Herrick.....	E. E....	Haworth, N. J.....	69 B.
William Blake Hindman.....	C.....	Chillicothe, O....	T. D. Chi.
Philip Schneider Hoffman, Jr.	E. E....	Raubsville.....	12 S.
Burton Hotchkiss.....	C. E....	Washington, D. C..	134 M.
Frank Elison Hutton.....	C. E....	Kingston, N. Y....	73 K.
Frank Henry Irmschler.....	C. E....	Easton.....	118 McK.
Thomas Cowling Jeffery.....	C.....	Pen Argyl.....	116 McK.
Floyd Myron Johnson.....	C. E....	Covington.....	151 P.
Edward Hunting Jones.....	C.....	East Hampton, N. Y.,	86 N.
Albert Barnes Judson.....	C. E....	Meshoppen.....	47 S.
Joseph Kadesh.....	C.....	Easton.. 1440 Washington.	
Albert Felix Kahn.....	L.....	Easton.....	37 S. 6th.
Arthur Emanuel Keiber.....	C.....	Drums.....	171 E.
Frank Henry Kelly.....	C. E....	Reedsville.....	152 P.
William Dawson Kirkpatrick..	E. E....	Chatham, N. J....	152 P.
Henry Reuben Koehler.....	C.....	Hazleton.....	163 E.
Gideon Richie Kreider, Jr.†...	Ch.....	Annville.....	97 McK.
William Stanley Lanterman..	E. M....	Easton.....	231 Bushkill
Davis Winans Lusk†.....	C.....	Newark, N. J.....	129 M.
Earl Douglass Laros.....	L.....	East.....	326 Bushkill.
George Shiffer McCaa.....	E. M....	Plains.....	133 M.
Frederick Collier McCutcheon	C.....	Sharpsburg.....	T. D. Chi.
Robert Eton McPherson.....	C.....	New Bloomfield.....	36 S.
Walter Ingham Macauley.....	E. E....	Phillipsburg, N. J.,	607 S. Main.
Harry Wilmer Markle.....	L.....	Greensburg.....	92 McK.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Frederick Stiles Martin.....	C. E....	Allentown.....	100 McK
Willard Charles Masonheimer .C.....		Weatherly.....	165 E.
Raymond Stanley Metzgar....	E. E....	Phillipsburg, N. J.	71 Bennett.
Nathan Roy Miller†.....	L.....	Mauch Chunk.....	100 McK.
Thomas Overfield Mitman....	C.....	Hellertown.....	Home.
John Francis A. Moore.....	L.....	Hornell, N. Y.....	130 M
Tilghman Huber Moyer.....	C. E....	Brooklyn, N. Y.....	79 N.
Arthur Henry Myers.....	L.....	Somerville, N. J....	174 E.
David Burrowes Nevin†.....	L.....	Easton.....	Home.
Harry Maynard Newman....	L.....	Piqua, Ohio.....	———
John Sanford Noble, Jr.....	L.....	Easton.....	226 Porter.
Lewis Anderson Park.....	L.....	East Allegheny.....	———
Joseph Oliver Parker.....	L.....	Pittsburg.....	T. D. Chi.
Raymond Townsend Pierson..	E. E....	Belvidere, N. J..	106 McK.
Stewart Rice Race.....	C.....	Cornish, N. J.....	34 S.
Donald Rankin.....	Ch.....	Scranton.....	70 B.
David Weimer Rial.....	Ch.....	Greensburg....	Prof. Hardy.
Frank Weimer Royer.....	E. E....	Greensburg.....	64 B.
Frank Carrie Shand†.....	C. E....	Kingston.....	———
William Thomas Shea.....	C. E....	Washington, D. C....	———
Joseph Albert Skeer†.....	C.....	Bloomsburg.....	D. K. E
Guy Fuller Smith.....	C. E....	Camptown.....	38 S
Louis Thurston Southwick...C. E....		North Haven, Conn.	D. K. E.
Clinton Emanuel Steinheiser .C.....		Mauch Chunk....	116 McK.
David Lloyd Swank.....	E. M....	Mauch Chunk....	D. K. E.
Philip Allen Swartz.....	C.....	Poughkeepsie, N. Y.	87 N.
Elmer Clayton Taylor.....	Ch.....	Cold Spring.....	145 P.
Reuben Archer Torrey, Jr....C.....		Philadelphia.....	80 N.
Norman Clifford Uhler.....	C.....	Easton.....	R. F. D. 1.
Harry Taylor Updegrove.....	E. M....	Easton.....	Paxinosa Ave.
Ernest Saul Urwitz†.....	E. E....	Wilkes-Barre.....	94 McK.
Alexander Hamilton Voorhees†	L.....	Jersey City, N. J..	73 K.
Donald Williams Vought†....	L.....	Englewood, N. J....	142 P.
Elmer Walker.....	C. E....	Trenton, N. J.....	134 M.
Roy Irving Walter.....	C.....	Easton...4th and Bushkill.	
Robert Lothrop Ware.....	C.....	Easton....E. Paxinosa ave.,	

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Arthur Trumbull Warner.....	E. E...	Orange, N. J.....	80 N.
George Albert Wellman.....	C. E...	Covington.....	35 S.
Joseph Clifford Wilkes.....	E. E...	Trenton, N. J...108	McK.
Charles Preston Woodnutt....	E. E...	Williamsport.....	87 N.
Milton K. Yorks.....	C.....	Bloomsburg.....	76 K.
Harry Ytkin.....	E. E...	Easton	—
Joseph Henry Zerbey, Jr.....	L.....	Pottsville.....	135 E.
SOPHOMORES.....			110

FRESHMAN CLASS, 1911.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
William Aaron Abbott.....	E. M...	Elmira, N. Y.....	168 E.
Harold Knowles Acker.....	E. M...	Washington, D.C.	601 High
Edmund Shaw Allen.....	C. E...	Camden, N. J.....	56 S.
James Hezekiah Allen.....	L.....	Kinton, Ohio.....	135 F.
Keats Wesley Allison.....	C.....	Derry	57 S.
Henry Bunn Anderson.....	Ch.....	Bloomsbury, N. J.....	Home
Clarence Douglas Andrews....	C. E...	Easton	—
George Daniel Arner.....	E. E...	Weissport	132 Cattell.
Leslie Mulford Armstrong....	E. E...	Mullica Hill, N. J.....	—
William Aston.....	C.....	Wilkes-Barre	50 S.
Delbert Strader Bachman....	E. E...	Easton	131 S. 4th.
Allen Eugene Bacon.....	L.....	Wilkes-Barre	230 Mc- Cartney.
John Loring Baker.....	L.....	Washington, D. C.	—
Edward Raymond Barnard....	C.....	Hamilton, Ontario.	59 S.
George Spencer Barrett.....	E. E.....	.....	—
Raymond Foster Barrett.....	C.....	Atlantic Highlands, N. J., 110 McK.	
Lawson Henry Bauer.....	Ch.....	Mertztown	91 McK.
Harry Edwin Beadell.....	E. E...	Easton	131 S. 14th.
Frederick Heman Beeman....	E. E...	Union, N. Y.....	51 S.
Charles Robert Bellamy.....	Ch.....	Scranton	72 B.
Frederick Luther Bentley....	Ch.....	Camden, N. J.....	167 E.
Raymond Chase Bergen.....	C. E...	Trenton, N. J.....	81 N.
Roscoe Conklin Berlin.....	E. M...	Slatington	607 High.
Charles Kniseley Boas.....	G. S...	Harrisburg	D. K. E.
Van Tuyl Boughton.....	C. E...	Valley Falls, N. Y.	122 Mc- Cartney
Floyd Thomas Bower.....	C.....	Wind Gap	Home
John George Boyd.....	L.....	Canaseraga, N. Y.....	21 S.
Benjamin Ray Brown.....	C. E...	Honesdale	—
Thomas Wesley Brown.....	Ch.....	E. Stroudsburg	—
Walter Edmund Brownne†...E. M...		Jersey City, N. J.....	75 K.
Paul Cyphers Carling.....	C. E...	Glen Gardner, N. J....	27 S.
Charles Elmer Cary.....	C. E...	Troy, N. Y.....	601 High.
Robert Albert Christman....	L.....	Kresgeville	143 S. 12th.
Rudolph N. Lauer Clymer....	Ch.....	Phillipsburg, N. J....	Home.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Elmer Raynor Colwell.....	L.....	Hickory Grove.....	154 E.
Myron Judson Conover.....	C. E...	Matawan, N. J.....	D. K. E.
William Daniel Conrad.....	C. E...	Reading.....	15 S.
Guy Edward Cornelius.....	C. E...	Elkland.....	108 McKen.
Harold Croasdale.....	Ch.....	Delaware Water Gap,	98 McK.
Howard Vincent Cuninghams.....	Ch.....	Pittsburg.....	—
William Frederick DeMott.....	C. E...	Green Village, N. J.,	128 M.
Donald Van Lear Downs.....	C. E...	Dover, Del.....	D. K. E.
William Findlay Downs.....	C. E...	Dover, Del.....	D. K. E.
George Bache DuBois.....	C. E...	Washington, D. C...	62 B.
Henry Banning Duncan.....	E. M...	Bellevue, Del.....	—
James Blair Easter.....	C. E...	Pittsburg.....	D. K. E.
John Milton Edwards.....	L.....	Pittsburg,	131 McCartney.
Robert Moore Eyster.....	E. M...	Chambersburg.....	99 McK.
Clarence Edward Feick.....	L.....	Easton.....	233 McCartney.
Theodore Sands Fillmore.....	C. E...	Shickshinny.....	D. K. E.
Edwin Clyde Foresman.....	C.....	Ford City.....	67 B.
John Richey Weller Fritts.....	L.....	Washington, N. J.....	—
Harold Wilson Furness.....	C.....	Philadelphia.....	86 N.
Rollin Proctor Gilbert.....	Ch.....	Camden, N. J.....	167 E.
Philip Lyman Hand.....	C.....	Wilkes-Barre.....	107 McK.
Paul Berdan Hart.....	C. E...	Pennington, N. J.....	—
Horace Morgan Hess.....	C.....	Phillipsburg, N. J...	Home.
Wilmer Jacob Hindenach.....	C.....	Durham.....	Home.
Max Hirsch.....	G. S...	Pittsburg, Pa.....	111 McK.
Clifton Burhans Hitt.....	Ch.....	Margaretville, N. Y...	153 E.
Raymond Solt Hittinger.....	C.....	Easton.....	322 N. 12th.
Charles Stanley Hoff.....	E. M...	Easton.....	129 Spring Garden.
Samuel Goodman Hoffenstein.....	L.....	Wilkes-Barre.....	156 E.
Albert Wallace Hogeland.....	C. E...	Newton.....	65 B.
Oliver Alexander Horner.....	E. E...	Emmitsburg, Md...	69 B.
Clarence William Horr.....	Ch.....	Newark, N. J.....	T. D. Chi.
John Willis Housel.....	M. E...	Easton.....	131 McCartney.
William Patrick Howard.....	E. E...	Duquesne.....	Lorenzo Bell.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Nicholas Van Reed Hunter	E. M.	Wyncote	137 F.
Paul Hutchinson	L.	Washington, N. J.	60 S.
Harry Richard Jahn	Ch.	Brooklyn, N. Y.	New St.
John Elwyn Johnson	C. E.	West Chester	108 McK.
Raymond Grant Canfield Jolly	C.	Orangeville	176 E.
Owen Robert Jones	C. E.	Slatington	607 High.
Omar Harrison Keller	L.	Doylestown	32 S.
Lawles John Kelly	L.	Dubuque, Iowa	—
William Cummings Kidd	C.	Philadelphia	48 S.
Floyd Clifton Kinnear	E. M.	Tidioute	—
Floyd Johnson Kintner	C.	Easton	1001 Butler.
Jeremiah Alexander Klotz	C.	Northampton	98 McK.
Earl Lee Kohler	C. E.	Gaines	133 M.
Ellsworth Stout Krantz	C.	Easton	8th and Northampton
Hans Heinrich Kudlich	E. M.	Drifton	110 McK.
Jacob Servis LaRue	C.	Easton	51 So. Second.
Guy Elbert Lavers	E. E.	Easton	126 Porter St.
Harry Enders Lehr	C. E.	Lykens	97 McK.
LeRoy Zeigler Leib	E. E.	Hazleton	—
William Ker Lenhart	C. E.	Philadelphia	Home.
Martin Hoffman Lindaberry	E. E.	Frenchtown, N. J.	30 S.
John Sheridan Linn	C.	Paoli	48 S.
Leslie Ransbury Long	Ch.	Wilkes-Barre	109 McK.
Lester Long	C. E.	Summit, N. J.	128 M.
Samuel Bingham Luccock	L.	Oak Park, Ill.	T. D. Chi.
George McCahon	C.	Kilrea Co., Derry, Ireland,	58 S.
Russell McCauley	C.	Altoona	150 P.
Henry Stanley McGarrah	C. E.	Scranton	233 McCartney.
Michael John McGrath	C. E.	Worcester, Mass.,	The Bushkill.
Herbert Sidney McKinstry	L.	North Wales	23 S.
Culver Barcalon McWilliam	G. S.	Somerville, N. J.	D. K. E.
Audley Lytle Mabon	C.	Indiana	134 M.
Earl Roy Mackintosh	C.	Ambridge	328 Mc-Cartney.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Harold Richard Mahoney.....	E. E...	Wilkes-Barre	79 N.
Percy William Hewitt Mann...	M. E...	Wilkes-Barre	50 S.
Jesse Russel Matson.....	G. S...	Wellsboro	146 P.
Philip Maue.....	E. M...	Hazleton	13 S.
Walter Henry Mechler.....	L.....	Jenkintown	36 S.
Ambrose Frederick Melan.....	L.....	Wilkes-Barre ..	607 High
Joseph Black Mellick.....	C. E...	Harrisburg	136 F.
John Calvin Merrill.....	Ch.....	Easton	200 So. 7th.
William Mewhinney.....	C.....	Easton	415 Valley Ave. 43 S.
Arthur Richards Miller.....	E. E...	Holland, N. J.....	27 S.
Frederich Adolphus Miller.....	L.....	Madison, N. J....	T. D. Chi.
Charles Cowell Mitchell.....	C. E...	Hackettstown, N. J..	Home.
Ralph Clark Nash.....	Ch.....	Warren, Ohio.....	136 F.
Warren Arthur Norris.....	E. M...	Troy, N. Y.....	601 High.
Jesse Spencer Parsons.....	L.....	Media	31 S.
William Walter Perry.....	M. E...	Easton	137 So. 13th.
Carl Seib Rankin.....	C. E...	Scranton	70 B.
H. L. Raul†.....	Spec...	Easton	Home.
George Lorenzo Relyea.....	C. E...	New Paltz, N. Y., Lorenzo Bell.	
Fred McGinley Rice.....	C. E...	Elkins Park	83 N.
Archibald Murray Richmond..	C.....	Boonton, N. J.....	43 S.
John Oswald Rinek.....	M. E...	Easton	422 Reeder.
John Rosenberry Rosen- berry, Jr.....	E. M...	Easton	60 S.
Thomas Henry Rowland.....	L.....	Camden, N. J.....	56 S.
John Herbert Rumbaugh.....	L.....	Mt. Pleasant ...	T. D. Chi.
Homer Greene Sandercock....	C. E...	Ariel	117 McK.
Jesse Earl Schelling.....	E. E...	Phillipsburg, N. J..	213 Chambers.
Irvin Schick.....	E. E...	Hazleton	14 S.
Peter John Schmidt.....	C. E...	Gatesville	118 McK.
Arthur Barber Schooley.....	C. E...	Wyoming	T. D. Chi.
Leon Moyer Schwenk.....	L.....	Perkasie	77 K.
Robert Pressly Scott.....	L.....	Butler	139 E.
Lloyd Clarence Shank.....	Ch.....	Titusville	74 K.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Lester Newton Shellenberger	E. M.	Easton	610 Brodhead.
Russell Lewis Shepler	E. E.	Vandergrift	76 K.
Christian Ludwig Siebert	G. S.	Pittsburg	131 McCartney
John Lemuel Simons	C. E.	Philadelphia	166 E.
Albert George Otto Smith	L.	Cumberland, Md.	168 E.
Everett Erma Smith	E. M.	Easton	—
James Robeson Smith	E. M.	Belvidere, N. J.	Home.
Leland Parker Smith	L.	Blue Point, L. I.	42 S.
Arthur Dodd Snyder	C.	Harmony, N. J.	Home.
John Elmer Stellwagon	L.	Easton	661 Walnut.
Elijah Compton Stewart	C.	Alexandria	132 Cattell.
Archibald Styer	C. E.	Burlington, N. J.	89 N.
Charles Benjamin Swartz	C.	Poughkeepsie, N. Y.	85 N.
Seth Byron Thomas	M. E.	Easton	147 So. 9th St.
Stanley Judson Thomas	Ch.	Scranton	233 McCartney.
Charles H. Tidd	L.	Effort	175 E.
Ernest Mortimer Tuttle	C.	Newark, N. J.	21 S.
Harry Walter Vetter	C. E.	Belvidere, N. J.	42 S.
Lynn Alexander Walker	C. E.	Philadelphia	Campus
Thomas Franklin Walton	E. M.	Lansford	71 B.
Gus Evans Warden	C. E.	Endeavor	129 M.
William Warfield	C.	Easton	Chestnut and McCartney.
Frederick Jacob Weeks	G. S.	West Pittston	—
William Lambertson White, Jr.	E. E.	Easton	East Ave and Monroe.
Howard Loomis Williams	E. E.	Wilkes-Barre	—
Joseph Horton Williams	C. E.	Wellsboro	74 K.
Edmond Talmage Witt	C.	Johnstown	58 S.
Clarence Ray Wolf	C.	Highspire	30 S.
Harrison Jacob Wolfe	Ch.	Easton	5 S. 5th.
Harry Smedley Wolf†	Ch.	Easton	233 McCartney.
Robert Woodcock	C. E.	Hollidaysburg	131 McCartney.
Paul Mortimer Young	L.	Sayre	155 E.
FRESHMEN			166

SUMMARY.

Courses.	Seniors.	Juniors.	Sophomores.	Freshmen.	Total.
Graduates.....					12
Classical.....	22	20	28	31	101
Latin Scientific.....	14	10	21	28	73
General Scientific.....	2	3	1	6	12
Civil Engineering.....	22	16	26	40	104
Electrical Engineering....	8	6	20	19	53
Mining Engineering.....	11	3	8	17	39
Chemical.....	9	7	6	19	41
Special.....		1		1	2
Mechanical Engineering....				5	5
Totals.....	88	66	110	166	442

CLASSIFICATION BY RESIDENCE.

Connecticut..... 1	Massachusetts... 2	Canada..... 1
Delaware..... 4	New Jersey.... 72	China..... 1
Dist. of Columbia 9	New York..... 35	Germany..... 1
Illinois..... 4	Ohio..... 5	Ireland..... 1
Iowa 2	Pennsylvania .. 287	Philippine Is.... 1
Maryland..... 2	Virginia..... 1	

ABBREVIATIONS OF ROOMS AND COURSES OF STUDY.

Brd.—Brainerd Hall.
 B.—Blair Hall.
 E.—East Hall.
 F.—Fayerweather Hall.
 K.—Knox Hall.
 M.—Martien Hall.
 McC.—McCartney St.

McK.—McKeen Hall.
 N.—Newkirk Hall.
 P.—Powell Hall.
 S.—South College.
 D. K. E.—Fraternity House.
 Sigma Chi.—Fraternity House.
 T. D. Chi.—Fraternity House.

C.—Classical	E. M.—Mining Engineering.
C. E.—Civil Engineering.	G. S.—General Scientific.
Ch.—Chemical.	L.—Latin Scientific.
E. E.—Electrical Engineering.	M. E.—Mechanical Engineering.

† Reciting on schedule.

—Absent at time of publication of catalogue.



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JULY	JANUARY	JANUARY
S M T W T F S	S M T W T F S	S M T W T F S
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AUGUST	FEBRUARY	FEBRUARY
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FEBRUARY, 1909

BULLETIN
OF
LAFAYETTE COLLEGE

GENERAL CATALOGUE
1908-1909

PUBLISHED QUARTERLY BY LAFAYETTE COLLEGE

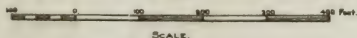
Entered as second-class matter November 20, 1906, at Easton, Pennsylvania
under the Act of Congress of July 16, 1894.

- 1 Pardee Hall.
- 2 South College.
- 3 Gayley Hall of Chemistry.
- 4 Observatory.
- 5 Jenks Biological Laboratory.
- 6 Private Laboratory.
- 7 College Office.
- 8 Gymnasium.
- 9 Van Wickle Library.
- 10 Brainerd Hall.
- 11 East Hall.
- 12 Powell Hall.
- 13 Fayerweather Hall.

2 and 11 to 18—

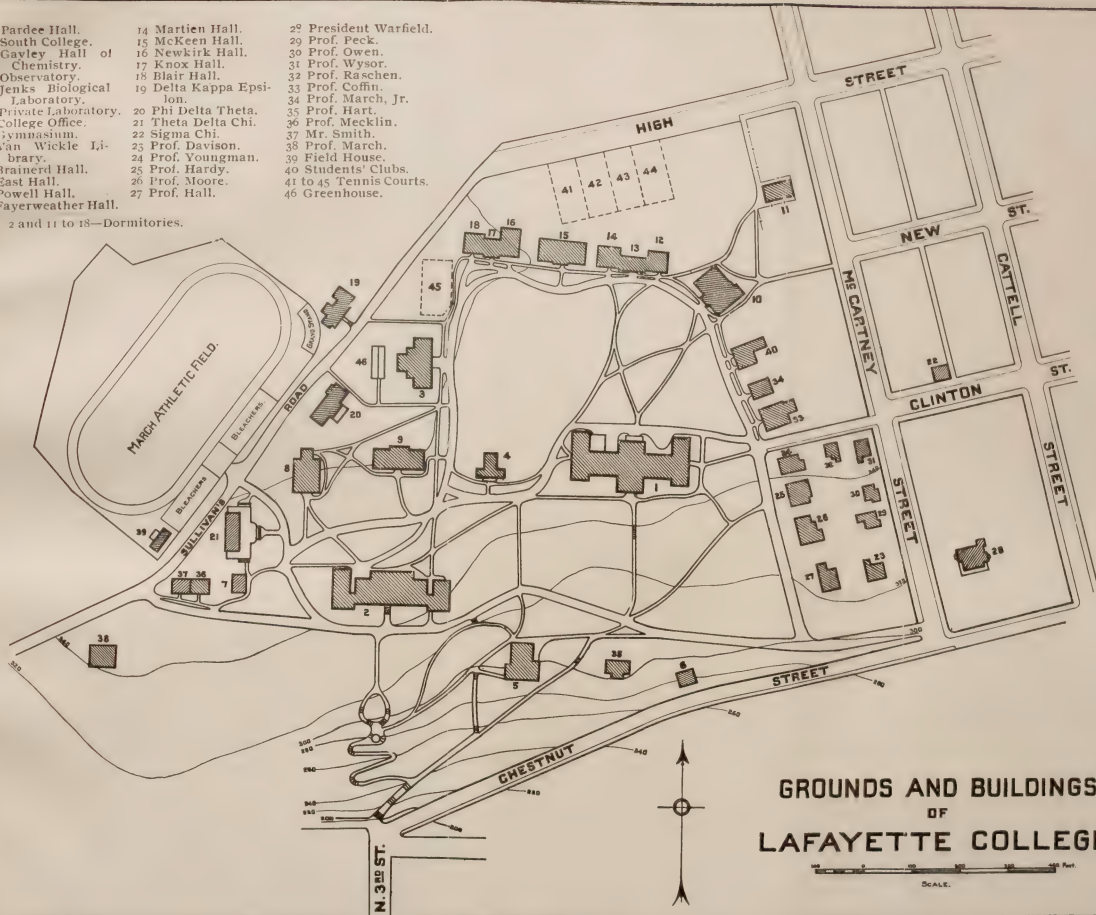


GROUNDS AND BUILDINGS OF LAFAYETTE COLLEGE.



- | | | |
|--------------------------------|-------------------------|-------------------------|
| 1 Pardee Hall. | 14 Martien Hall. | 29 President Warfield. |
| 2 South College. | 15 McKeen Hall. | 30 Prof. Peck. |
| 3 Gayley Hall of Chemistry. | 16 Newkirk Hall. | 31 Prof. Owen. |
| 4 Observatory. | 17 Knox Hall. | 32 Prof. Raschen. |
| 5 Jenks Biological Laboratory. | 18 Blair Hall. | 33 Prof. Coffin. |
| 6 Private Laboratory. | 19 Delta Kappa Epsilon. | 34 Prof. March, Jr. |
| 7 College Office. | 20 Phi Delta Theta. | 35 Prof. Hart. |
| 8 Gymnasium. | 21 Theta Delta Chi. | 36 Prof. Wyssor. |
| 9 Van Winkle Library. | 22 Sigma Chi. | 37 Mr. Smith. |
| 10 Brainerd Hall. | 23 Prof. Davison. | 38 Prof. March. |
| 11 East Hall. | 24 Prof. Youngman. | 39 Field House. |
| 12 Powell Hall. | 25 Prof. Hardy. | 40 Students' Clubs. |
| 13 Fayerweather Hall. | 26 Prof. Moore. | 41 to 45 Tennis Courts. |
| | 27 Prof. Hall. | 46 Greenhouse. |

2 and 11 to 18—Dormitories.



GROUNDS AND BUILDINGS
 OF
 LAFAYETTE COLLEGE.

B U L L E T I N O F
LAFAYETTE COLLEGE

INCLUDING THE COURSES OF STUDY
IN THE
CLASSICAL *and* SCIENTIFIC
DEPARTMENTS

AND THE
DEPARTMENTS *of* CIVIL, MINING *and*
ELECTRICAL ENGINEERING,
and of CHEMISTRY

SEVENTY-SEVENTH YEAR

1908-1909

EASTON, PENNSYLVANIA

1909

VERITAS LIBERABIT.

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1908.

December 23, Wednesday... First term ends.

1909.

March 24, Wednesday Second term ends.

May 31, Monday.....Memorial Day, Barge Oratorical Contest.

Sermon before the Brainerd Society.

June 24, Thursday.....Examinations for admission.

September 16, Thursday . . . College year begins.

November 25, Thursday....Thanksgiving Day.

December 22, Wednesday . . First term ends.

1910.

March 23, Wednesday Second term ends.

LAFAYETTE COLLEGE.

Lafayette College is situated at Easton, Pa., upon a site of remarkable beauty, overlooking the confluence of the Delaware and Lehigh rivers. It is thoroughly furnished with the buildings and apparatus to do the work of a progressive college and polytechnic school, and also with the equipment, so important in this age, for a healthful and wholesome student life. Its large and able faculty represent the best traditions of scholarship as well as the recent extensions of scientific knowledge and the newer methods of research. It frankly recognizes its obligation to give its students training, as well as the opportunities for acquiring knowledge, and to make its discipline include moral and spiritual culture. Recent revisions of the requirements for admission and of the course of study have been made. It will be found that these changes meet the demands of the day for liberty of choice without sacrificing the supreme consideration of thoroughness.

The first exercises were held on May 9, 1832, and the 75th anniversary was celebrated in 1907 by exercises which marked an epoch in the history of the College. A fund was also raised by the friends and Alumni of the College for the increase of the endowment and the extension of the work of the College.

Easton is a railroad center and easily accessible from all directions. It is about seventy-five miles from New York, seventy from Philadelphia, eighty from Scranton and one hundred from Wilkes-Barre and Harrisburg. The Lehigh Valley, Pennsylvania, N. J. Central, Phila.

& Reading, D. L. & W., and L. & H. R. Railways afford convenient and rapid facilities for railway travel. It is also an important industrial center, and there are many advantages afforded the students in the Technical courses by its location. Its situation upon a lofty elevation, fronting south, and perfectly drained, also ensures the most perfect conditions for the promotion of health. The plan of the grounds and the pictures of some of the buildings give but a faint idea of the beauty of the grounds and buildings.

There are many points of interest in regard to the College and its work which it is not possible to embody in this publication. Correspondence, especially with prospective students, is therefore cordially invited.

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MEETING OF THE TRUSTEES.

Thursday, February 11, 1909..... WINTER MEETING
 Tuesday, June 22, 1909..... COMMENCEMENT WEEK.
 Wednesday, October 20, 1909..... FOUNDERS' DAY.

FACULTY.

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(George B. Markle Professorship.)

JACOB D. UPDEGROVE, A.M., M.D.,
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EDGAR MOORE GREEN, A.M., M.D.,
Consulting Physician in the Department of Physical Training.

ALVIN DAVISON, A.M., PH.D.,
Professor of Biology.

(Jesse Chamberlain Professorship of Botany.)

FREDERICK BURRITT PECK, PH.D.,
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REV. JOHN MOFFAT MECKLIN, A.M., PH.D.,
Professor of Mental and Moral Philosophy and Hebrew.
(James Renwick Hogg Professorship.)

REV. JOHN FREDERICK LOUIS RASCHEN, A.M.,
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JOHN ROYDEN HESS, PH.B.,
Instructor in Chemistry.

EDWARD FRANKLIN FARQUHAR, A.M.,
Instructor in English.

WILLIAM BENJAMIN MARQUARD, E.M.,
Instructor in Mining.

HILLIER MCCLURE BURROWES, A.B.,
Instructor in English.

ALBERT THEODORE GOLDBECK, B.S.,
Instructor in Civil Engineering.

ROBERT WILLIAM THOROUGHGOOD, C.E.,
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Instructor in Hebrew.

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HERMANN SCHUMACHER, PH.D.
Exchange Instructor in German.

SAMUEL LLOYD BARRICK, A.B.,
Instructor in English.

JOSHUA LEWIS MINER, A.B.,
Assistant in Cement Laboratory.

WILLIAM TRUMBOWER FOSTER, PH.B.,
Assistant in Biology.

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Clerk.

JAMES W. MOORE, A.M., M.D.,
Inspector of Buildings.

REV. JOHN F. STONECIPHER, D.D.,
Librarian.

REV. MAURICE A. FILSON, A.M.,
Assistant in Library.

EDWARD HART, PH.D.,
Curator of Gayley Hall, and Librarian of the Henry W. Oliver Library.

CHARLES B. GREEN, E.M.,
Registrar and Treasurer.

ALBERT MOORE LANE, PH.B.,
Assistant in Treasurer's Office.

CLASS DEANS.

SENIOR CLASS.....The President.
JUNIOR CLASS.....Professors Mecklin and Peck.
SOPHOMORE CLASS.....Professors Youngman and Hall.
FRESHMAN CLASS.....Professors Hardy and Owen.

LAFAYETTE COLLEGE.

ADMISSION.

Every applicant for admission to the College is expected to report at the College offices and register immediately on his arrival. Before registering he must submit to the Registrar a satisfactory certificate of moral character from his pastor or some other person known to the College authorities, and a diploma or certificate of graduation from the school which he last attended, or, if he be not a graduate, a statement that he leaves the school with the approval of its principal and is honorably dismissed to this College, with a statement of the studies which he has pursued and the course which he desires to pursue. His application having been approved he is admitted to the examinations. Examinations are regularly held on the day following the annual commencement day in June, and the days preceding the first day of the Autumn term in September, and also on the first day of the second and third terms.

Special attention is called to the changes in the entrance requirements since the publication of the 1905-'06 Catalogue. Candidates may now offer either German or French, and either Physics or Chemistry, for admission to the Latin Scientific, General Scientific and Technical Courses.

REQUIREMENTS FOR ADMISSION TO THE FRESHMAN CLASS.

CLASSICAL COURSE.

For admission to the Classical Course candidates are examined in the following subjects:

Geography (A) and (B)	English.
History (A) and (B).	Latin.
Mathematics (A).	Greek.

(For details of subjects, see pages 13-16).

LATIN SCIENTIFIC COURSE.

For admission to the Latin Scientific Course candidates are examined in the following subjects:

Geography (A) and (B).	English.
History (A) and (B).	Latin.
Mathematics (A).	German (A) or French (A).
Physics or Chemistry.	

(Candidates for the Classical and Latin Scientific Course offering Mathematics (A) and (B) can take advanced courses in Mathematics)

GENERAL SCIENTIFIC COURSE.

For admission to the General Scientific Course candidates are examined in the following subjects:

Geography (A).	English.
History (A).	German (A) and (B) or French (A)
Mathematics (A).	and (B).
Physics or Chemistry.	

and one of the following subjects Mathematics (B); a Second Modern Language (A) and (B); Latin (Grammar, 4 books of Caesar and 2 orations of Cicero or an equivalent).

CIVIL, MINING AND ELECTRICAL ENGINEERING AND CHEMICAL COURSES.

For admission to the Engineering and Chemistry courses candidates are examined in the following subjects:

Geography (A).	Physics or Chemistry.
History (A).	English.
Mathematics (A) and (B).	German (A) and (B) or French (A) and (B).

DETAILS OF SUBJECTS REQUIRED FOR ADMISSION TO THE
FRESHMAN CLASS.

GEOGRAPHY (A).—Political or Physical Geography.

GEOGRAPHY (B).—Ancient Geography.

HISTORY (A).—*United States*: Johnston, McMaster or Fiske.

General History: Fisher or Freeman. Such books as Myers' and Swinton's General History are not recommended.

HISTORY (B).—*Roman History* to Augustus, and *Greek History* to Alexander. The requirements are intended to be additional to the requirement in General History, and should be met by the use of books on Roman and Greek History, such as Myers' "Rome, Its Rise and Fall"; Morey's, Leighton's, or Allen's, Roman History, and Morey's or Oman's Greek History.

MATHEMATICS (A).—*Arithmetic*: Complete, including the Metric System.

Algebra: Fundamental principles. Factoring. Fractions. Simple Equations. Involution. Evolution. Exponents. Quadratic Equations. Simultaneous Quadratic Equations. Equations Solved as Quadratics. Properties of Quadratic Equations.

Geometry: Plane Geometry entire; as in Wentworth, Wells or Loomis.

MATHEMATICS (B).—*Solid Geometry*.

Algebra: Surds and Imaginaries. Simple Indeterminate Equations. Inequalities. Ratio. Proportions and Variations. Progressions.

Plane Trigonometry: Through the solution of right and oblique triangles (Crawley or an equivalent); candidates should bring their logarithmic tables to the examination.

PHYSICS.—The elementary principles (Avery, Gage, Hall and Bergen or Carhart and Chute).

CHEMISTRY.—Elements of Inorganic Chemistry.

ENGLISH. *Grammar*.—A general examination will be given with special reference to any particular text-book to test familiarity with paradigms and syntactical analysis, and the correct use of English idioms.

Franklin's Autobiography and *Milton's Paradise Lost*, Books I and II.

Prose Composition: The writing of a short essay will be required upon a subject drawn from the foregoing text-books. No candidate will be accepted in English whose work is notably deficient in point of spelling, punctuation, idioms, or division into paragraphs. The English requirements recommended by the Association of Colleges and Preparatory Schools of the Middle States and Maryland will be accepted in place of Franklin and Milton as follows:

Books to be studied: 1909, 1910, 1911: Shakespeare's *Macbeth*; Milton's *Lycidas*, *Comus*, *L'Allegro*, and *Il Penseroso*, Burke's *Speech on Conciliation with America*, or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*, Macaulay's *Life of Johnson*, or Carlyle's *Essay on Burns*.

Books to be read: 1909, 1910, 1911:

Group I (two to be selected). Shakespeare's *As You Like It*, *Henry V*, *Julius Caesar*, *The Merchant of Venice*, *Twelfth Night*.

Group II (one to be selected). Bacon's *Essays*; Bunyan's *The Pilgrim's Progress, Part I*; *The Sir Roger de Coverley Papers* in "The Spectator"; Franklin's *Autobiography*.

Group III (one to be selected). Chaucer's *Prologue*; Spenser's *Faerie Queene* (selections); Pope's *The Rape of the Lock*; Goldsmith's *The Deserted Village*; Palgrave's *Golden Treasury (First Series) Books II and III*, with special attention to Dryden, Collins, Gray, Cowper and Burns.

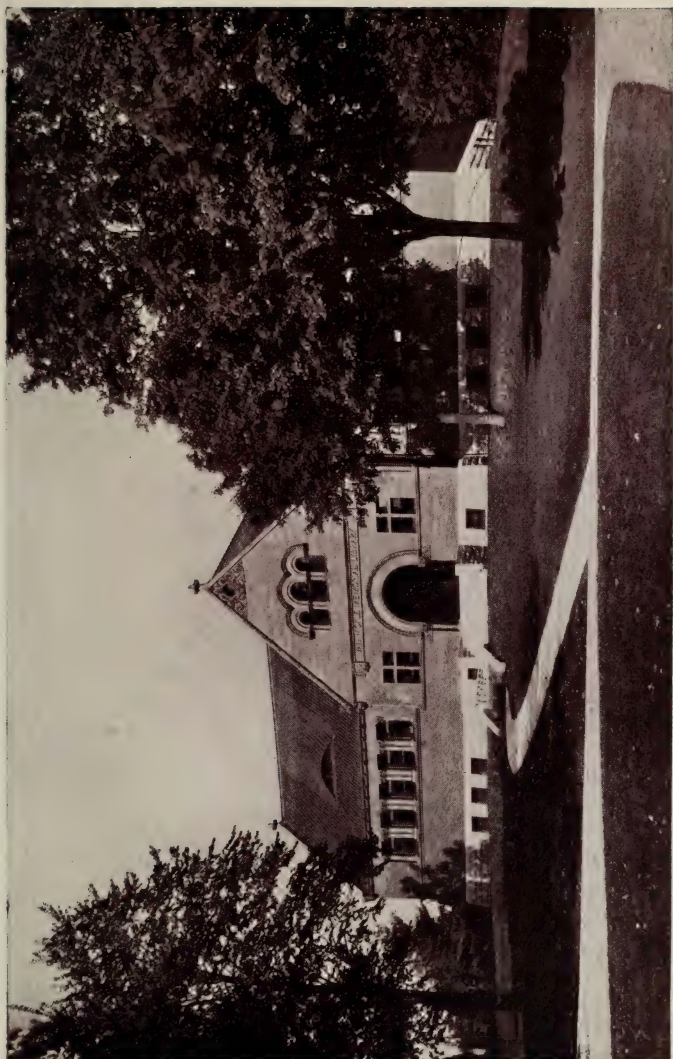
Group IV (two to be selected). Goldsmith's *The Vicar of Wakefield*; Scott's *Ivanhoe*; Scott's *Quentin Durward*; Hawthorne's *The House of the Seven Gables*; Thackeray's *Henry Esmond*; Mrs. Gaskell's *Cranford*; Dickens' *A Tale of Two Cities*; George Eliot's *Silas Marner*; Blackmore's *Lorna Doone*.

Group V (two to be selected). Irving's *Sketch Book*; Lamb's *Essays of Elia*; De Quincey's *Joan of Arc* and *The English Mail Coach*; Carlyle's *Heroes and Hero Worship*; Emerson's *Essays* (selected); Ruskin's *Sesame and Lilies*.

Group VI (two to be selected). Coleridge's *The Ancient Mariner*; Scott's *The Lady of the Lake*; Byron's *Mazeppa* and *The Prisoner of Chillon*; Palgrave's *Golden Treasury (First Series) Book IV*, with special attention to Wordsworth, Keats and Shelley, Macaulay's *Lays of Ancient Rome*; Poe's *Poems*; Lowell's *The Vision of Sir Launfal*; Arnold's *Sohrab and Rustum*; Longfellow's *The Courtship of Miles Standish*; Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur*; Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Evelyn Hope*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *The Boy and the Angel*, *One Word More*, *Hervé Riel*, *Pheidippides*.

LATIN—*Grammar:* The Roman method of pronunciation is used.

Caesar; *Commentaries*, four books, for a portion of which an equivalent in Nepos will be received.



VAN WICKLE MEMORIAL LIBRARY.

THE
JOHN CRERAR
LIBRARY

Cicero: Orations, seven.

Virgil: Æneid, six books, *Bucolics*.

Prose Composition: Daniell's, or equivalent.

GREEK.—*Grammar: Pronunciation according to the written accents and in accordance with the preface to Goodwin's Grammar or Hadley-Allen's, Sections 11, 14, 19, 20, 21.*

Xenophon: Anabasis, four books for a portion of which an equivalent in *The Cyropaedia* will be received.

Homer: Iliad or Odessey, three books; or

New Testament: Gospels, three.

Prose Composition: Collar and Daniell or equivalent.

GERMAN (A).—An accurate knowledge of the principles of grammar, especially the inflection of articles, adjectives, pronouns, and nouns; the conjugation of the weak and strong verbs; the uses of the modal auxiliaries; the prepositions and their government; the elementary rules of syntax and word order; to be able to read at sight ordinary German prose. It is believed that this requisite facility can be acquired by reading not less than two hundred duodecimo pages of simple German.

GERMAN (B).—This includes a thorough knowledge of accidence, of the elements of word-formation, and of the principal uses of the prepositions and conjunctions. The candidate should be familiar with the essentials of German syntax, and must possess the ability to translate into German easy English prose; to translate at sight passages from standard classical authors. The reading of at least three hundred and fifty pages in addition to that required under German (A) will develop such ability. For examination no specific authors or work are designated. All candidates are required to bring a statement from his teacher, mentioning text-books used and authors read, including the number of pages translated.

FRENCH (A).—This embraces a thorough knowledge of the rudiments of grammar, including the inflection of the regular and the more common irregular verbs; the inflection of nouns and adjectives for gender and number; the uses of articles and partitive constructions; the forms and positions of personal pronouns; the uses of the other pronouns. Candidates should be able to read at sight ordinary modern prose. It is believed

that this ability is acquired by reading two hundred dúodecimo pages from the works of at least three different authors.

FRENCH (B).—Candidates should show a thorough knowledge of accidence, and a familiarity with the essentials of French syntax, especially the uses of the tenses, modes, prepositions and conjunctions. They must be able to translate into French a connected passage of simple English, and to translate at sight standard French authors. This proficiency may be acquired by reading, in addition to that required under French (A), not less than four hundred pages of the works of various standard authors. For examination no special authors or works are designated. Applicants should present a statement from their teachers setting forth the text-books used and the number of pages translated.

PARTIAL OR SPECIAL COURSES.

In addition to the courses above specified, students may be admitted under exceptional circumstances to pursue courses of study of a special character not leading to a degree. Such students are required to undergo such preliminary examination as may be deemed necessary to ascertain their fitness to pursue the proposed course. When admitted they are subject to the same rules and regulations and the same examinations in the studies pursued as are other undergraduates. On completing their course they will receive, on application, certificates of proficiency in such courses as they have satisfactorily completed.

ADVANCED STANDING.

Candidates for advanced standing are examined not only in the preparatory studies, but also specially in the previous studies of the class they wish to enter, or their full equivalents.

Students from another College bringing certificates of

rank and honorable dismissal are permitted to recite on trial with corresponding rank in this College, until there is sufficient test of their qualifications for admission to regular standing. They will, however, be examined on whatever studies of the course may not be in the curriculum of the College from which they come, unless there are full equivalents.

No student, whether from another College or not, will be admitted to the Senior Class as a candidate for a degree after the beginning of the second term.

CONDITIONS.

Students who fail to pass in a part of the subjects in which they are examined may be admitted upon the condition that they pass a satisfactory examination on such subjects before the end of the term next after that in which they enter. The number of such conditions with which a student is admitted to the College will be determined in each case by a vote of the Faculty.

CERTIFICATES.

Certificates of the Examination Board of the School and College Association of the Middle States and Maryland, of the Regents of the University of the State of New York and of certain approved preparatory schools are received in lieu of examination for entrance. Certificates, which will be accepted only from graduates of regularly prescribed preparatory courses, must be signed by the Principal and certify only to work done during school hours. They should be filed with the Registrar before the entrance examination in June. Blank certificates will be furnished upon application. Wherever the certificate does not cover one or more of the require-

ments of admission or supply a satisfactory equivalent, an examination upon such subject or subjects will be required. Such certificates will not be received after one year from the completion of the period of study for which they are given unless an additional certificate of continued study accompany them.

MATRICULATION.

No student is considered a regular member of the College until after his matriculation, which takes place thirty days after his entrance. During the interval between his admission and matriculation he is, however, in all respects subject to the laws of the College.

DESCRIPTION OF COURSES.

The course of study was originally arranged to provide for three periods of lecture, recitation, drawing, or laboratory work each day except Wednesday and Saturday. No exercises were scheduled for Wednesday and Saturday afternoons. Wednesday afternoon was long set apart for the meeting of the literary societies. Subsequently the meetings of these societies were transferred to Wednesday evening and in order to co-operate with their work no college exercises were scheduled for Wednesday afternoon and the first exercise on Thursday morning was given to elocution. With the increase of the number of courses and the variety incident to the introduction of the elective system in Junior and Senior years it has been found impossible to adhere to the original arrangement of three periods each day and to keep Wednesday afternoon entirely free from College work. The growing lack of interest in oratory and debate has also diminished the attendance upon the literary societies and the reason for the omission of College work on Wednesday afternoon and the scheduling of elocution for Thursday morning has largely disappeared. The College, however, strongly recommends the literary societies and their work to all students and will co-operate with the students who join these societies in enabling them to obtain the best possible conditions for the cultivation of public speaking.

All students are expected to arrange a schedule of at least sixteen weekly exercises. These exercises are calculated on the basis of *periods*—the period being the

equivalent of one recitation hour or three hours of drawing room, laboratory, or field work. A lecture which does not require previous preparation may be combined with two hours of practical work in a *period*.

The following courses of study are offered:

CLASSICAL COURSE.

Leading to the Degree of A.B.

LATIN SCIENTIFIC COURSE.

Leading to the Degree of Ph.B.

GENERAL SCIENTIFIC COURSE.

Leading to the Degree of B.S.

CIVIL ENGINEERING COURSE.

Leading to the Degree of C.E.

MINING ENGINEERING COURSE.

Leading to the Degree of E.M.

ELECTRICAL ENGINEERING COURSE.

Leading to the Degree of E.E.

CHEMICAL COURSE.

Leading to the Degree of B.S. in Chemistry.

COURSE NUMBERS.

For description of courses see pages 68-109.

LANGUAGE AND LITERATURE.

- 1- 50 ENGLISH.
- 51- 70 ELOCUTION.
- 71-160 GERMAN AND ROMANCE LANGUAGES.
- 161-200 CLASSICS.
- 201-210 HEBREW.

HISTORY, POLITICAL SCIENCE, AND PHILOSOPHY.

- 221-250 BIBLE.
- 251-310 PHILOSOPHY.
- 311-350 HISTORY.
- 351-400 POLITICAL AND SOCIAL SCIENCE

SCIENCE AND MATHEMATICS.

- 401-440 MATHEMATICS.
- 441-460 GRAPHICS.
- 461-490 PHYSICS.
- 491-530 GEOLOGY.
- 531-550 ASTRONOMY.
- 551-580 BIOLOGY AND HYGIENE.

CIVIL ENGINEERING.

- 601-610 SURVEYING.
- 611-620 RAILROADS.
- 621-630 MECHANICS.
- 631-640 ROADS AND PAVEMENTS.
- 641-650 MASONRY.
- 651-660 CEMENT AND CONCRETE.
- 661-670 HYDRAULICS.
- 671-680 SEWERAGE.
- 681-690 WATER SUPPLY.
- 691-698 ROOFS AND BRIDGES.
- 699-700 THESES.

MINING ENGINEERING.

- 701-710 MINE SURVEYING.
- 711-730 MINING METHODS.
- 731-740 MINING MACHINERY.
- 741-750 MINE ADMINISTRATION.
- 751-760 MINING LAW.
- 761-770 THESES.

ELECTRICAL ENGINEERING.

- 801-810 ELEMENTS OF ELECTRICAL ENGINEERING.
- 811-820 DYNAMO-ELECTRIC MACHINERY.
- 821-830 ALTERNATING CURRENTS.
- 831-840 ELECTRICAL LABORATORY.
- 841-850 ELECTRIC POWER TRANSMISSION.
- 851-860 THE TELEPHONE.
- 861-870 THESES.

CHEMISTRY.

901-940	CHEMISTRY.
941-950	CHEMICAL ARITHMETIC.
951-960	METALLURGY.
961-970	TECHNICAL GERMAN.
971-980	THESES.

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CLASSICAL COURSE.

The Classical Course, which leads to the Degree of Bachelor of Arts, consists of the historic course in the *Arts*, or *Humanities*, and retains the regular character of that course, which has so long been regarded as the foundation of a liberal education. The course has a fixed curriculum during the earlier years, but in the latter part of the course latitude is allowed by the introduction of elective studies for the student to select such studies as he deems the best preparation for his subsequent pursuits.

This Department being the usual preparation for the learned professions, including teaching and journalism, special regard is given to the necessities of these professions, so that in addition to being the thoroughly tried means of securing a broad and liberal culture and an approved foundation of Christian scholarship, it is particularly fitted to prepare men for the learned professions. It is also recognized as a desirable preparation for other pursuits, including scientific and technical professions, wherever the circumstances of the student will permit.

The instruction embraces a systematic study of the Bible and the Evidences of Christianity throughout the course, of the Ancient and Modern Languages and their literatures, together with Comparative Philology; Pure and Applied Mathematics; Physics, Chemistry, and the Natural Sciences; Rhetoric and Elocution; Logic and Metaphysics; History and Political Science; and Mental and Moral Philosophy.

SYNOPSIS.
CLASSICAL COURSE.
FRESHMAN YEAR.
First Term.

	Periods per week.	Course number.*
ALGEBRA 2 AND SOLID GEOMETRY 2†.....	4	402 & 406
OR		
SOLID GEOMETRY†.....	4	407
GREEK.....	4	161
LATIN.....	4	181
ENGLISH.....	2	1
HYGIENE.....	1	580
THE BIBLE.....	1	221

Second Term.

ALGEBRA†.....	4	403
OR		
ALGEBRA†.....	4	404
GREEK.....	4	162
LATIN.....	4	182
ENGLISH.....	2	2
ELOCUTION.....	1	51
THE BIBLE.....	1	222

Third Term.

TRIGONOMETRY†.....	4	412
OR		
ALGEBRA†.....	4	405
GREEK.....	4	163
LATIN.....	4	183
ENGLISH.....	2	3
ELOCUTION.....	1	52
THE BIBLE.....	1	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY†.....	4	418
OR		
TRIGONOMETRY†.....	4	413
GREEK.....	4	164

*See pages 68-109.

†Entered with Mathematics B, Division A.

‡Entered with Mathematics A, Division B.

	Periods per week.	Course number.*
LATIN.....	4	184
ENGLISH.....	2	15
FRENCH.....	2	126
ELOCUTION.....	1	53
THE BIBLE.....	1	227
THEMES.		

Second Term.

PLANE AND SOLID ANALYTICAL GEOMETRY†....	4	419
OR		
PLANE ANALYTICAL GEOMETRY‡.....	4	420
GREEK.....	4	165
LATIN.....	4	185
ENGLISH.....	2	11
FRENCH.....	2	127
ELOCUTION.....	1	54
THE BIBLE.....	1	228
THEMES.		

Third Term.

PHYSICS.....	4	461
GREEK.....	4	166
LATIN.....	2	186
FRENCH.....	2	128
GERMAN.....	2	80
CHEMISTRY.....	2	901
ELOCUTION.....	1	55
THE BIBLE.....	1	229
THEMES.		

JUNIOR YEAR.

First Term.

PHYSICS.....	4	462
GERMAN.....	3	81
ELOCUTION.....	1	56
THE BIBLE.....	1	236
THEMES.		

*See pages 68-109.

†Division A.

‡Division B.

ELECTIVES.

	Periods per week.	Course number.*
MATHEMATICS.....	4	429
GREEK.....	4	167
GEOLOGY.....	2	491
ENGLISH.....	4	19
CHEMISTRY.....	2	902
BIOLOGY.....	2	551
FRENCH.....	2	129
HISTORY.....	2	321
LATIN.....	2	187
BIOLOGY.....	2	571
ENGLISH.....	2	41

Second Term.

PHYSICS.....	4	463
PHILOSOPHY.....	3	251
ELOCUTION.....	1	57
THE BIBLE.....	1	237
THEMES.		

ELECTIVES.

ENGLISH.....	4	20
MATHEMATICS.....	4	430
GEOLOGY.....	2	492
GREEK.....	2	168
GERMAN.....	2	82
HISTORY.....	2	322
CHEMISTRY.....	2	903
HISTORY.....	2	331
FRENCH.....	2	130
LATIN.....	2	188
BIOLOGY.....	4	552
ENGLISH.....	2	42
SPANISH (optional).....	2	141
ITALIAN (optional).....	2	151

Third Term.

HISTORY.....	2	351
PHILOSOPHY.....	2	252

*See pages 68-109.

	Periods per week.	Course number.*
PHILOSOPHY.....	2	271
ELOCUTION.....	1	58
THE BIBLE.....	1	238
THEMES.		

ELECTIVES.

ENGLISH.....	4	21
MATHEMATICS.....	4	431
GEOLOGY.....	2	493
GREEK.....	2	169
GERMAN.....	2	83
CHEMISTRY.....	2	904
BIOLOGY.....	4	553
FRENCH.....	2	131
LATIN.....	2	189
ENGLISH.....	4	43

SENIOR YEAR.

First Term.

ASTRONOMY.....	4	536
PHILOSOPHY.....	3	281
ELOCUTION.....	1	59
CHURCH HISTORY.....	1	242
THEMES.		

ELECTIVES.

ENGLISH.....	4	22
HISTORY.....	2	361
PHILOSOPHY.....	2	253
CHEMISTRY.....	2	905
INTERNATIONAL LAW.....	2	376
MATHEMATICS.....	2	432
GERMAN.....	2	99
BIOLOGY.....	4	554
ENGLISH.....	4	44
GREEK.....	2	170
FRENCH.....	2	132
GEOLOGY.....	2	494
LATIN.....	2	190
ANGLO-SAXON (optional).....	1	12

*See pages 68-109.

Second Term.

	Periods per week.	Course number.*
PHILOSOPHY.....	3	291
POLITICAL ECONOMY.....	2	381
ELOCUTION.....	1	60
CHURCH HISTORY.....	1	243
THEMES.		

ELECTIVES.

HISTORY.....	2	352
MATHEMATICS.....	2	433
GERMAN.....	2	100
GEOLOGY.....	2	495
ENGLISH.....	4	23
BIOLOGY.....	4	555
GREEK.....	2	171
FRENCH.....	2 133 or	135
LATIN.....	2	191
HEBREW.....	2	201
SOCIOLOGY.....	2	391
ENGLISH.....	4	45
BLACKSTONE.....	2	371
CHEMISTRY.....	2	906
ASTRONOMY.....	2	541
HISTORY.....	2	362
PHILOSOPHY.....	2	301
ANGLO-SAXON (optional).....	1	13

Third Term.

PHILOSOPHY.....	2	292
PHILOLOGY.....	3	30
ELOCUTION.....	1	61
THE BIBLE.....	1	244
THEMES.		

ELECTIVES.

HISTORY.....	2	353
MATHEMATICS.....	2	434
GERMAN.....	2	101
GEOLOGY.....	2	496

*See pages 68-109.

	Periods per week.	Course number.*
ENGLISH.....	4	23
BIOLOGY.....	4	556
GREEK.....	2	172
FRENCH.....	2 134 or	136
LATIN.....	2	192
HEBREW.....	2	202
ENGLISH.....	4	46
BLACKSTONE.....	2	372
CHEMISTRY.....	2	907
ASTRONOMY.....	2	542
HISTORY.....	2	363
POLITICAL ECONOMY.....	2	382
PHILOSOPHY.....	2	302
ANGLO-SAXON (optional).....	1	14

*See pages 68-109.

PARDEE SCIENTIFIC DEPARTMENT.

This Department was organized in 1866, in accordance with the conditions of a gift from Ario Pardee, Esq., of Hazleton, Pa. The original organization has been from time to time greatly enlarged and extended largely through the continued munificence of the founder. There are at present two general courses of study, Latin Scientific and the General Scientific, and four technical courses.

LATIN SCIENTIFIC COURSE.

This course, which leads to the Degree of Bachelor of Philosophy, was designed to meet the wishes of those who desire to pursue a course of liberal study, with the omission of Greek. It therefore is the same as the Classical Course except that the time devoted to the study of Greek in that course is given to the pursuit of studies mainly of a scientific character, but throughout the general course of this school great importance is paid to the study of the English language under the special direction of Professor Francis A. March, Jr. In the Freshman year the substitutes for Greek are German and English Language and Composition, while in the Sophomore they are various English studies. In the first term, Sophomore year, French is begun and continued throughout the year.

SYNOPSIS.

LATIN SCIENTIFIC COURSE.

The course of study is the same as the Classical Course except as follows:

FRESHMAN YEAR.

German 84-85-86 is substituted for Greek, four periods a week being given to this subject during the three terms.

SOPHOMORE YEAR.

The Bible is read in Latin 230-31-32 instead of Greek. English 16-17-18 and German 87-88-89 are substituted for Greek.

JUNIOR YEAR.

The Bible is read in Latin 239-40-41 instead of Greek. English History 321 is substituted for German 81. German 91-2 or 94-5 or 97-8 are substituted for 82-3.

(For schedule of study of the Classical Course see pages 29-34)

GENERAL SCIENTIFIC COURSE.

This course leads to the degree of Bachelor of Science, and consists of a curriculum in which Mathematics, the Modern Languages and their Literatures, especially English, and the Natural and Physical Sciences receive principal attention. It includes, however, the more general studies of the Arts Course, such as History, Logic and Rhetoric, Mental and Moral Philosophy.

The Mathematics of this course is the same as the Mathematics of the technical courses, or the Latin Scientific Course, as the student may elect upon entrance. Students electing the mathematics of the technical course may not change unless free from conditions.

SYNOPSIS.

GENERAL SCIENTIFIC COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA†.....	4	401
OR		
ALGEBRA AND SOLID GEOMETRY ‡.....	4	402 & 406

	Periods per week.	Course number.*
ENGLISH.....	2	1
CHEMISTRY.....	4	911
DRAWING.....	2	441
GERMAN ¹	2	75
OR		
FRENCH ²	2	111
HYGIENE.....	1	580
THE BIBLE.....	1	221

Second Term.

TRIGONOMETRY†.....	5	411
OR		
ALGEBRA‡.....	4	403
ENGLISH.....	2	2
CHEMISTRY.....	2	912
GERMAN ¹	2	76 or 71
FRENCH ²	2	112 or 116
DRAWING.....	2	442
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY AND MENSURATION†...	5	416 & 421
OR		
TRIGONOMETRY‡.....	4	412
ENGLISH.....	2	3
CHEMISTRY.....	2	913
FRENCH.....	2	113 or 117
GERMAN.....	2	77 or 72
DRAWING.....	2	443
THE BIBLE.....	1	223

*See pages 68-109.

†Entered with Mathematics B.

‡Entered with Mathematics A.

¹Entered on German.

²Entered on French.

SOPHOMORE YEAR.

First Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY 2 AND DIFFERENTIAL CALCULUS 3†.....	5	417 & 426
OR		
ANALYTICAL GEOMETRY.....	4	418
ENGLISH.....	2	15
ENGLISH.....	2	16
GERMAN ¹	2	78 or 73
FRENCH ²	2	114 or 118
CHEMISTRY.—Analytical Chemistry.....	2	914
THE BIBLE.....	1	224

Second Term.

CALCULUS†.....	5	427
OR		
ANALYTICAL GEOMETRY‡.....	4	419
ENGLISH.....	1	17
CHEMISTRY.....	2	915
GERMAN ¹	2	79 or 74
FRENCH ²	2	115 or 119
THE BIBLE.....	1	225
ANGLO-SAXON.....	2	11

Third Term.

PHYSICS.....	4	461
ENGLISH.....	4	18
BIOLOGY.....	4	569
CHEMISTRY.....	2	916
THE BIBLE.....	1	226

*See pages 68-109.

†Entered with Mathematics B.

‡Entered with Mathematics A.

¹Entered on German.

²Entered on French.

JUNIOR YEAR.

First Term.

	Periods per week.	Course number.*
PHYSICS.....	4	462
HISTORY.....	2	321
ELOCUTION.....	1	56
THE BIBLE.....	1	233

ELECTIVES.

GEOLOGY.....	2	491
ENGLISH.....	4	19
ENGLISH.....	2	41
CHEMISTRY.....	2	902
BIOLOGY.....	2	551
BIOLOGY.....	2	571
FRENCH.....	2	129
GERMAN.....	2	90-93-96

After the First Term, Junior year, the schedule of study for the General Scientific Course is the same as for the Clasic 1 Course, except that during the rest of the Junior year the Bible is read in German 234-35 instead of Greek; and German 91-2 or 94-5 or 97-8 is substituted for 82-3. (For schedule of study of the Classical Course see pages 29-34.)

*See pages 68-109.

THE CIVIL ENGINEERING COURSE.

The course in Civil Engineering has been designed to develop the mental faculties of the student in those studies which form the foundation of all branches of Technology with additional training in the subjects classed as Civil Engineering. The course also includes such general subjects, essential to a liberal education, as are shown in the synopsis on pages 43-47.

The graduate is prepared for immediate usefulness in the field and office, and, after a moderate amount of professional experience, to fill positions of trust and importance, not only in his chosen profession, but in allied work in mining, mechanical, electrical and architectural engineering.

CIVIL ENGINEERING LABORATORIES AND EQUIPMENT.

The Department has a large equipment of instruments necessary for the various branches of engineering field practice, including tapes, compasses, transits, levels, plane tables, barometers, standard base line tapes and pulling apparatus, sextants, solar attachments, chronometers, floats and current meters. A twelve-inch portable altazimuth instrument, reading to single seconds by micrometer microscopes, and provided with level for double zenith distances, is used for instruction in Geodesy and Practical Field Astronomy. A precision level of the latest design is employed in instruction in precise leveling. The astronomical observatory contains an equatorial telescope, transit, clock, chronograph, meteorological instruments, etc.

For use in the lecture room there are numerous models of the various types of bridge and roof trusses; several complete sets of full weight standard rolled sections; numerous full weight sections of riveted joints, representing bridge and boiler work, hand and power riveting; wall charts; working drawings; photographs; slide rules; and lantern, with reflectoscope. The hydraulic lecture room is directly connected with the laboratory, and the equipment of the latter is used for demonstration purposes before the class.

The Department also has a full-weight pin-connected highway bridge of fifty feet span and fourteen feet roadway weighing twelve tons, together with all false work and tools necessary to erect the same.

The GENERAL TESTING LABORATORY contains one 200,000 pound, three 100,000 pound screw testing machines and one 60,000 pound hydraulic testing machine arranged for tension, compression and transverse testing; a 4,000 pound wire tester and a small machine for testing cord, twine, etc.; a 4,000 pound transverse machine for specimens up to sixteen feet, and a smaller transverse machine for specimens up to five feet, arranged with micrometers for measuring deflections, and extension meters for measuring fiber deformations. A transverse machine of 400,000 pound capacity for specimens up to twenty-five feet in length and four feet in width is now in course of construction. The laboratory also contains a torsion machine of 125,000 inch-pound capacity for specimens up to twenty feet in length and a 10,000 inch-pound torsion machine of the pendulum type for short specimens; a number of elongation meters of different types, compressometers and smaller micrometers, hand tools,

etc., and apparatus for calibrating machines. There are also a number of special apparatus for shearing, punching, bending, etc., tests.

The CEMENT LABORATORY contains three 1,000 and two 2,000 pound machines for testing cement by tensile, compressive, and transverse stress, a machine for moulding briquettes under pressure, a power-driven Boehme Hammer, a ball mill, an automatic sieving apparatus, apparatus for accelerated tests, etc. It is further equipped with large immersion tanks with running water, cement bins, briquette racks, and the necessary moulds, sieves, scales, moist closets, specific gravity apparatus, etc. It also contains a number of slate-top mixing tables, each provided with a moist closet, scales and the necessary hand tools.

The CONCRETE LABORATORY contains a large mixing floor, an immersion tank and the necessary moulds for beams up to fifteen feet in length, moulds for compression specimens, a beam crane and trucks of two tons capacity for the convenient handling of specimens, scales, sieves, measures and storage bins for stone, sand and cement.

The HYDRAULIC LABORATORY contains a vertical pressure tank eighteen feet in height and five feet in diameter, arranged for making experiments on the flow of water through orifices and nozzles under heads up to three hundred feet, and provided with a device by which the orifice plates can be removed while the tank is under pressure; other smaller tanks for use under low heads; a standpipe sixty feet high; two tanks, thirty feet long for weir experiments and measurements of quantity; a turbine; impulse wheels; a centrifugal pump run by electric motor and provided with electric

measuring instruments and transmission dynamometer; rotary, disc and reciprocating water meters; a Venturi meter; a weighing tank; absolute and differential pressure gauges; and other appliances for the measuring of water used in experiments and for the testing of meters, motors, nozzles and fire hydrants; as well as arrangements for lecture-room illustrations. There is also connected with the laboratory a boiler plant and a one-million gallon Worthington duplex pump upon which tests are made.

The ROAD MATERIAL LABORATORY contains a rattler for testing paving brick; a Deval abrasion machine for testing road metal; hot oven, scales, immersion tank, etc.

The SHOP, which is in charge of a skilled mechanic, contains two lathes, a drill press, a planer, a milling machine, a grinder and other necessary appliances for preparation of test specimens, models and apparatus and for repair work.

The LIBRARY contains the best and latest books and periodicals upon engineering subjects and the students are encouraged to make free use of the same.

SYNOPSIS OF STUDIES.

CIVIL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911
GERMAN†.....	2	75
or		
FRENCH‡.....	2	111

*See pages 68-109.

†Entered on German.

‡Entered on French

	Periods per week.	Course number.*
ENGLISH.....	2	I
DRAWING AND LETTERING.....	2	44I
THE BIBLE.....	I	22I
HYGIENE AND PHYSICAL CULTURE.....	I	580

Second Term.

TRIGONOMETRY.....	5	41I
CHEMISTRY.....	2	912
GERMAN } †.....	2	76
FRENCH }.....	2	116
or		
GERMAN } †.....	2	71
FRENCH }.....	2	112
ENGLISH.....	2	2
PROJECTIONS AND LETTERING.....	2	442
THE BIBLE.....	I	222

Third Term.

ANALYTICAL GEOMETRY.....	3	416
MENSURATION AND LOGARITHMS.....	2	421
CHEMISTRY.....	2	913
GERMAN } †.....	2	77
FRENCH }.....	2	117
or		
GERMAN } †.....	2	72
FRENCH }.....	2	113
ENGLISH.....	2	3
DRAWING AND LETTERING.....	2	443
SURVEYING.....	2	60I
THE BIBLE.....	I	223
SUMMER SCHOOL IN SURVEYING (in vacation).		
Three weeks.....		602

*See pages 68-109.

†Entered on German.

‡Entered on French.

SOPHOMORE YEAR.

First Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
CHEMISTRY.....	2	914
GERMAN } †.....	2	78
FRENCH }.....	2	118
or		
GERMAN } †.....	2	73
FRENCH }.....	2	114
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2	444
SURVEYING.....	2	603
THE BIBLE.....	1	224
THEME.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
CHEMISTRY.....	2	915
GERMAN } †.....	2	79
FRENCH }.....	2	119
or		
GERMAN } †.....	2	74
FRENCH }.....	2	115
ENGLISH.....	1	5
DESCRIPTIVE GEOMETRY.....	3	445
RAILROADS.....	2	611
THE BIBLE.....	1	225
THEME.		

Third Term.

LEAST SQUARES }.....	3	436
DIFFERENTIAL EQUATIONS }.....		437
CHEMISTRY.....	2	916

*See pages 68-109.

†Entered on German.

‡Entered on French.

	Periods per week.	Course number.*
PHYSICS.....	4	461
MACHINE DRAWING.....	2	446
ELEMENTARY MECHANICS.....	2	621
RAILROADS.....	2	612
THE BIBLE.....	1	226
SUMMER SCHOOL IN SURVEYING (in vacation). Three weeks.....		613
THEME.		

JUNIOR YEAR.

First Term.

PHYSICS.....	4	462
METALLURGY.....	2	951
CRYSTALLOGRAPHY.....	2	511
APPLIED MECHANICS.....	4	622
RAILROADS.....	3	614
MECHANICS OF MATERIALS.....	2	624
CEMENT.....	2	651
THE BIBLE.....	1	233
THEME.		

Second Term.

PHYSICS.....	4	463
PETROGRAPHY.....	2	512
SPANISH (optional).....	2	141
ITALIAN (optional).....	2	151
APPLIED MECHANICS.....	4	623
MECHANICS OF MATERIALS.....	3	625
CONCRETE.....	2	652
RAILROADS.....	2	615
ROADS AND PAVEMENTS.....	2	631
THE BIBLE.....	1	234
THEME.		

Third Term.

THE STEAM ENGINE.....	4	476
MINERALOGY (systematic).....	3	513
SANITARY BIOLOGY.....	2	561
SPANISH (optional).....	2	142

*See pages 68-109.



MARTIEN, FAYERWEATHER AND POWELL HALLS.

THE
JOHN CRERAR
LIBRARY

	Periods per week.	Course number.*
ITALIAN (optional)	2	152
RAILROADS.	2	616
MECHANICS OF MATERIALS.	2	626
HYDRAULICS.	2	661
THE BIBLE.	1	235
THEME.		

SENIOR YEAR.

First Term.

GENERAL GEOLOGY.	2	516
DESCRIPTIVE ASTRONOMY.	2	531
ROOFS AND BRIDGES.	2	691
ROOF DESIGN.	3	694
GRAPHIC STATICS.	1	698
HYDRAULICS.	3	662
MASONRY.	2	641
THE BIBLE.	1	242
THEME.		

Second Term.

POLITICAL ECONOMY.	2	381
GENERAL GEOLOGY.	2	517
PRACTICAL ASTRONOMY.	2	541
ROOFS AND BRIDGES.	2	692
BRIDGE DESIGN.	2	695
SEWERAGE.	2	671
WATER SUPPLY.	3	681
MASONRY DESIGN.	2	642
THE BIBLE.	1	243
THEME.		

Third Term.

PRACTICAL ASTRONOMY.	2	542
ROOFS AND BRIDGES.	3	693
BRIDGE DESIGN.	3	696
BRIDGE ERECTION. (two days)		697
SEWERAGE DESIGN.	2½	672
WATER SUPPLY DESIGN.	2½	682
THESIS.	2	699
THE BIBLE.	1	244

*See pages 68-109.

THE MINING ENGINEERING COURSE.

The aim of this course is to provide a good education, to lay a sound foundation in Engineering, and to give special preparation in Mining, Geology, Chemistry, Metallurgy, and Assaying.

Courses in Surveying, Analytical Mechanics, Mechanics of Materials, Materials of Construction, Laboratory Physics, and Railroad Engineering are given.

The courses in Mathematics, Languages, Physics, and Pure Graphics are the same in all the Engineering Departments.

A course in the Theory of Steam Engineering is followed by Graphical Constructions and Computations.

In Mechanical Engineering, after the courses in Analytical Mechanics, Mechanics of Materials, Materials of Construction, and Graphic Statics, a term of Machine Design and Construction is given.

In Surveying, the theory and practice extends through the first three years, and includes: Chain, Compass and Transit Surveying; Adjustment of Instruments; Leveling; City Surveying; Topographical Surveying; Railroad Reconnaissance, Location, and Construction, with Profile Plans, Earthwork Calculations, Bills, of Material, Estimates, Specifications; and Contracts; Theory of Mine Surveying, and the actual survey of a mine.

Following the course in Electricity as given in Physics, two periods each week for two terms are devoted to

the study of Electrical Machinery with selected laboratory work, having especial reference to the application of electricity to mining operations.

The course in Drawing includes: Elements of Mechanical Drawing, tracings and blue prints; Free-hand Drawing and Lettering; Descriptive Geometry; Topographical Drawing; Graphic Statics; Map Drawing; Machine Drawing and Design. Additional drawing is also required in connection with mining problems.

The work in Chemistry begins with the first term of the Freshman year, and continues, without any break, for two years. Lectures and text-book study are accompanied by recitations and laboratory practice.

Metallurgy is given in the Junior year, and embraces the metallurgy of iron, steel, gold, silver, copper, lead, zinc, etc. Thorough courses are also given in Assaying and Blowpiping.

Particular stress is laid on a thorough course in English, which extends over the first five terms. Both German and French are studied five terms for the first two years. Two periods each week for one term are devoted to the study of Political Economy. A theme written on some assigned technical subject is required of the student each term.

In addition to the courses in Mineralogy and Geology, as previously explained, the mining engineers are given a course of two hours each week for one term in the study of Ore Deposits, and a course of the same length is given in Field Geology. Instruction in the classroom will be supplemented, so far as possible, by a study of the different kinds of ore, and of the "country rock" in which they occur. A special course in the modern

methods of determining rocks in thin sections by means of the polarizing microscope, with instruction in the proper methods of preparing and mounting the sections, will be offered; and practice in the ordinary methods of field work in geology, with the mapping and sectioning of a certain region, will be given.

The course in Mining proper begins with the Theory of Mine Surveying and the solution of problems for determining the position of faulted ore bodies. Then follows Prospecting for ore deposits in lodes, beds, and placers; Prospecting for magnetite with the magnetic needle, and borings for water, oil and gas. The study of Rope, Rod, and Diamond Drill Boring is followed by that of Blasting and Excavation. In this connection the various tools, machines, and explosives are studied, together with their application in Blasting and Quarrying. Shaft Sinking, Shaft Boring, and Tunneling are studied, together with the materials for the support of excavated spaces and the methods of their application. While all the methods of Exploitation are investigated, particular attention is given to the mining of soft ore bodies, and of anthracite and bituminous coal. In the treatment of Haulage and Winding, special consideration is also given to the requirements of coal mining. Prominence is given to the study of Ventilation and Lighting because of their great importance in coal mining. The subject of Drainage receives careful treatment. Mining law is studied with reference to locations on public lands, and also with reference to the prevention of mine accidents. The Mechanical Separation of Ores is studied, and designs and reviews of Special Mining Operations are made. The principles involved in de-

termining the values of Mines and Quarries are discussed.

The Mining Engineering students use a separate room as a study. This is provided with an excellent Mining Library, and is supplied with the leading Mining periodicals. By the aid of a topical index, the library is regularly used in the study of the subjects assigned. The student is in this way led to many original sources for information, and becomes acquainted with the prominent works on Mining.

Magnetite, hematite, and limonite iron mines are close at hand, and the anthracite coal mines and zinc mines are easily accessible; these, with extensive quarries of slate, limestone, steatite, granite, serpentine, and sandstone in the vicinity, offer excellent opportunities for the study of mining and quarrying operations.

The Ingersoll-Rand Company, one of the largest manufacturers of mine machinery in the world, is located at Easton. This gives the Mining students the opportunity of seeing the construction of important mine machinery and of testing the machines.

Frequent visits are made to the mines and quarries in the vicinity, and two weeks in the spring vacation are spent at some prominent mining region in the practice of Mine Surveying and in the study of Practical Mining. Students are strongly advised to spend at least one summer vacation during their course in actual work at the mines.

Attendance at one session of the Summer School of Surveying is required of all Mining Engineering students, and attendance at the second session is strongly recommended.

The students in Mining Engineering have the privilege

of electing additional work in Chemistry, Metallurgy or Mining Geology.

MINING ENGINEERING EQUIPMENT.

In Mechanics and Mechanics of Materials, work is given in the GENERAL TESTING LABORATORY. In Hydraulics, the Mining students make tests in the HYDRAULIC LABORATORY. Laboratory work in Assaying and Metallurgy is given in laboratories connected with the CHEMICAL LABORATORY.

There is a separate Mine Department Library and Reading-room, which contains a large Mining library and is supplied with the leading Mining periodicals.

There is connected with the Department a distinct mine drafting and construction room, and a dark-room for photography and blue-printing.

The Department is equipped with two mine transits, large mine level, aneroid barometers, solar attachments, anemometers, etc., and all the accessory instruments necessary for two complete mine survey outfits.

A projecting lantern with about 500 slides is used in illustrating lectures. New slides are added each year.

The Department possesses maps, charts, models, photographs, sample collections of ores, small machines and machine parts, working drawings with bills of material, trade catalogues, etc.

SYNOPSIS OF STUDIES.

MINING ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911

*See pages 68-109.

	Periods per week.	Course number.*
GERMAN†.....	2	75
or		
FRENCH‡.....	2	111
ENGLISH.....	2	1
DRAWING AND LETTERING.....	2	441
THE BIBLE.....	1	221
HYGIENE AND PHYSICAL CULTURE.....	1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	912
GERMAN } †.....	2	76
FRENCH } †.....	2	116
or		
GERMAN } †.....	2	71
FRENCH } †.....	2	112
ENGLISH.....	2	2
PROJECTIONS AND LETTERING.....	2	442
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY.....	3	416
MENSURATION AND LOGARITHMS.....	2	421
CHEMISTRY.....	2	913
GERMAN } †.....	2	77
FRENCH } †.....	2	117
or		
GERMAN } †.....	2	72
FRENCH } †.....	2	113
ENGLISH.....	2	3
DRAWING AND LETTERING.....	2	443
SURVEYING.....	2	601
THE BIBLE.....	1	223
SUMMER SCHOOL IN SURVEYING (in vacation).		
Three weeks.....		602

*See pages 68-109.

†Entered on German.

‡Entered on French.

LAFAYETTE COLLEGE.

SOPHOMORE YEAR.

First Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
CHEMISTRY.....	2	914
GERMAN } †.....	2	78
FRENCH }.....		
OR		
GERMAN } †.....	2	73
FRENCH }.....		
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2	444
SURVEYING.....	2	603
THE BIBLE.....	1	224
THEME.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
CHEMISTRY.....	2	915
GERMAN } †.....	2	79
FRENCH }.....		
OR		
GERMAN } †.....	2	74
FRENCH }.....		
ENGLISH.....	1	5
DESCRIPTIVE GEOMETRY.....	3	445
RAILROADS.....	2	611
THE BIBLE.....	1	225
THEME.		

Third Term.

LEAST SQUARES }.....	3	436
DIFFERENTIAL EQUATIONS }		
CHEMISTRY.....	2	916
PHYSICS.....	4	461

*See pages 68-109.

†Entered on German.

‡Entered on French.

	Periods per week.	Course number.*
ELEMENTARY MECHANICS.....	2	621
MACHINE DRAWING.....	2	446
RAILROADS.....	2	612
THE BIBLE.....	1	226
THEME.		

JUNIOR YEAR.

First Term.

PHYSICS.....	4	462
APPLIED MECHANICS.....	4	622
MECHANICS OF MATERIALS.....	2	624
MINE SURVEYING.....	3	701
METALLURGY.....	2	951
CRYSTALLOGRAPHY.....	2	511
THE BIBLE.....	1	233
THEME.		

Second Term.

PHYSICS.....	4	463
APPLIED MECHANICS.....	4	623
MECHANICS OF MATERIALS.....	3	625
METALLURGY.....	2	952
PETROGRAPHY.....	2	512
SPANISH (optional).....	2	141
MINING (Prospecting and Deep Boring).....	2	711 & 712
THE BIBLE.....	1	234
THEME.		

SPRING VACATION MINING TRIP.

Third Term.

MECHANICS OF MATERIALS.....	2	626
THE STEAM ENGINE.....	4	476
MINERALOGY (Systematic).....	3	513
MINE ENGINEERING (Blasting and Quarrying).....	2	713
SPANISH (optional).....	2	142
MAP OF MINE SURVEY.		
THE BIBLE.....	1	235
THEME.		

* See pages 68-109.

SENIOR YEAR.

First Term.

	Periods per week.	Course number.*
GENERAL GEOLOGY.....	2	516
HYDRAULICS.....	5	663
MACHINE DESIGN.....	2	447
MINE CONSTRUCTION.....	3	719
MINING (Shaft Sinking, Drifting and Tunneling).....	2	714
MINING (Exploitation).....	2	715
THE BIBLE.....	1	242
THEME.		

ELECTIVES.

MINING GEOLOGY.....	2	523
METALLURGY.....	2	953
MINING.....	2	721

Second Term.

GENERAL GEOLOGY.....	2	517
ASSAYING.....	2	955
ELECTRICITY APPLIED TO MINING.....	2	731
POLITICAL ECONOMY.....	2	381
MINING LAW.....	2	751
MINING (Transportation).....	2	716
MINING (Ventilation and Lighting).....	2	717
THE BIBLE.....	1	243
THEME.		

ELECTIVES.

MINING GEOLOGY.....	2	524
CHEMISTRY (Metallurgical).....	2	954
MINING.....	2	722

Third Term.

MINING GEOLOGY (Field Geology).....	2	522
MINING GEOLOGY (Economic Geology).....	2	521
ELECTRIC MINE MACHINERY.....	2	732
MINE ADMINISTRATION.....	2	741
MINING (Mine Drainage).....	3	718
ORE DRESSING.....	4	720
THE BIBLE.....	1	244
GRADUATION THESIS.		761

* See pages 68-109.

THE ELECTRICAL ENGINEERING COURSE.

This course is designed to develop in the student a knowledge of the fundamental principles underlying the work of the successful electrical engineer.

It is parallel to the other technical courses, and differs from them in substituting the study of Physics, especially Magnetism and Electricity, for the strictly professional portions of the other courses.

During the Sophomore year, the students of this department are given a course in physical laboratory, which is laid out with special reference to their future work.

Beginning with the Junior year, the fundamental principles of Electrical Engineering are studied both in the class-room and in the laboratory. The aim has been to so arrange the work in these two lines of study, that each will supplement the other, and give the student a firm grasp of the principles involved.

This plan is carried out also, through the Senior year, with a gradually increasing concentration upon the study of the special applications of electricity to engineering work.

Thus the graduate is fitted to take up in an effective and intelligent manner, any branch of electrical work requiring special technical training.

ELECTRICAL ENGINEERING LABORATORIES AND EQUIPMENT.

The laboratories are large and well arranged. The

main electrical laboratory is thirty by sixty feet in dimensions, and is fitted up with representative types of continuous and alternating generators and motors, lamp-banks, water rheostats, brakes, etc.; and the necessary instruments are supplied for loading and testing generators and motors.

The laboratories are supplied from the Easton Power Company's station, with two-phase alternating current, at a frequency of sixty cycles. This current is available for testing purposes.

A fifty kilowatt motor-generator set has recently been installed for the purpose of supplying the laboratories with direct current. This set consists of a seventy-five horse power induction motor, directly connected to two twenty-five kilowatt, 120 volt direct current dynamos, the current from which is supplied to the laboratories by means of the three-wire system.

In case of need, direct current from the plant of the Easton Power Company is also available.

While designed primarily as a source of direct current, this motor-generator set is so installed as to be available at all times for experimental tests by the students.

A portion of the laboratories is fitted up for the more delicate tests required. This consists of two rooms, each being about twenty-two feet square, containing the necessary instruments for accurate testing, among which are a Leeds and Northrup Potentiometer, a Thompson Quadrant Electrometer, D'Arsonval Galvanometers, Wheatstone Bridges, Condensers, etc.

All laboratory work is quantitative as well as quali-

tative in character, special emphasis being placed on the necessity for precision in all work.

The departmental library is well stocked with the best works on electrical subjects, and is kept thoroughly up-to-date. The library, in connection with the laboratories, is regarded as an exceedingly important instrument of instruction.

SYNOPSIS OF STUDIES.

ELECTRICAL ENGINEERING COURSE.

FRESHMAN YEAR.

	<i>First Term.</i>	Periods per week.	Course number.*
ALGEBRA.....		4	401
CHEMISTRY.....		4	911
GERMAN†.....		2	75
or			
FRENCH‡.....		2	111
ENGLISH.....		2	1
DRAWING AND LETTERING.....		2	441
THE BIBLE.....		1	221
HYGIENE AND PHYSICAL CULTURE.....		1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	912
GERMAN } †.....	2	76
FRENCH }.....	2	116
or		
GERMAN } ‡.....	2	71
FRENCH } ‡.....	2	112
ENGLISH.....	2	2
PROJECTIONS AND LETTERING.....	2	442
THE BIBLE.....	1	222

*See pages 68-109.

†Entered on German.

‡Entered on French.

Third Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY.....	3	416
MENSURATION AND LOGARITHMS.....	2	421
CHEMISTRY.....	2	913
GERMAN } FRENCH } \dagger	$\left. \begin{array}{l} 2 \\ 2 \end{array} \right\}$	$\left. \begin{array}{l} 77 \\ 117 \end{array} \right\}$
or		
GERMAN } FRENCH } \dagger	$\left. \begin{array}{l} 2 \\ 2 \end{array} \right\}$	$\left. \begin{array}{l} 72 \\ 113 \end{array} \right\}$
ENGLISH.....	2	3
DRAWING AND LETTERING.....	2	443
THE BIBLE.....	1	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
CHEMISTRY.....	2	914
GERMAN } FRENCH } \dagger	$\left. \begin{array}{l} 2 \\ 2 \end{array} \right\}$	$\left. \begin{array}{l} 78 \\ 118 \end{array} \right\}$
or		
GERMAN } FRENCH } \dagger	$\left. \begin{array}{l} 2 \\ 2 \end{array} \right\}$	$\left. \begin{array}{l} 73 \\ 114 \end{array} \right\}$
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2	444
PHYSICAL MEASUREMENTS.....	2	481
THE BIBLE.....	1	224
THEME.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
CHEMISTRY.....	2	915
GERMAN } FRENCH } \dagger	$\left. \begin{array}{l} 2 \\ 2 \end{array} \right\}$	$\left. \begin{array}{l} 79 \\ 119 \end{array} \right\}$
or		
GERMAN } FRENCH } \dagger	$\left. \begin{array}{l} 2 \\ 2 \end{array} \right\}$	$\left. \begin{array}{l} 74 \\ 115 \end{array} \right\}$

*See pages 68-109.

 \dagger Entered on German. \ddagger Entered on French.

	Periods per week.	Course number.*
ENGLISH.....	1	5
DESCRIPTIVE GEOMETRY.....	3	445
PHYSICAL LABORATORY.....	2	482
THE BIBLE.....	1	225
THEME.		

Third Term.

LEAST SQUARES	}	}	3	436
DIFFERENTIAL EQUATIONS				437
CHEMISTRY.....			2	916
PHYSICS.....			4	461
MACHINE DRAWING.....			2	446
ELEMENTARY MECHANICS.....			2	471
PHYSICAL LABORATORY.....			2	483
THE BIBLE.....			1	226
THEME.				

JUNIOR YEAR.

First Term.

PHYSICS.....	4	462
APPLIED MECHANICS.....	4	472
CRYSTALLOGRAPHY.....	2	511
ELECTRICAL LABORATORY.....	2	831
ELEMENTS OF ELECTRICAL ENGINEERING.....	3	801
THE BIBLE.....	1	233
THEME.		

Second Term.

PHYSICS.....	4	463
APPLIED MECHANICS.....	4	473
MECHANICS OF MATERIALS.....	3	627
ELECTRICAL LABORATORY.....	2	832
ELEMENTS OF ELECTRICAL ENGINEERING.....	2	802
THE BIBLE.....	1	234
THEME.		

Third Term.

MECHANICS OF MATERIALS.....	3	628
THE STEAM ENGINE.....	4	476

*See pages 68-109.

	Periods per week.	Course number.*
DYNAMO ELECTRIC MACHINERY.....	2	811
ELEMENTS OF ELECTRICAL ENGINEERING.....	2	803
ELECTRICAL LABORATORY.....	2	833
THE BIBLE.....	1	235
THEME.		

SENIOR YEAR.

First Term.

HYDRAULICS.....	5	663
MACHINE DESIGN.....	2	447
DYNAMO ELECTRIC MACHINERY.....	6	811
ELECTRICAL LABORATORY.....	2	834
THE BIBLE.....	1	242
THEME.		

Second Term.

POLITICAL ECONOMY.....	2	381
ALTERNATING CURRENTS.....	6	821
ELECTRIC POWER TRANSMISSION.....	3	841
ELECTRIC POWER STATIONS.....	2	842
ELECTRICAL LABORATORY.....	2	835
THE BIBLE.....	1	243
THEME.		

Third Term.

ALTERNATING CURRENT MACHINERY.....	6	822
THE ELECTRIC RAILROAD.....	3	843
THE TELEPHONE.....	2	851
ELECTRICAL LABORATORY.....	2	836
THESIS.....	2	861
THE BIBLE.....	1	244
GRADUATION THESIS.		

*See pages 68-109.

THE CHEMICAL COURSE.

The aim of this course, which leads to the Degree of Bachelor of Science in Chemistry, is to fit young men for practical work in chemistry, either as chemists in iron and steel works, in manufacturing establishments, or as chemical manufacturers. Great attention is paid to analytical chemistry, and especially to the chemistry of cement and the chemistry and metallurgy of iron and steel. Graduates are fitted to take paid positions as chemists immediately upon graduation. For men of the proper character immediate and remunerative employment can be secured. This course will also be found an excellent preparation for the study of medicine.

While the instruction centers in the two branches of Chemistry and Metallurgy, the course aims to supply a thorough education along the lines most necessary for a successful career as a responsible chemist.

CHEMICAL AND METALLURGICAL LABORATORIES AND EQUIPMENT.

The Chemical and Metallurgical laboratories are contained in Gayley Hall, a new fire-proof structure built for the use of this Department. There are four large and four smaller laboratories and a shop, besides three stock rooms, two balance rooms, a quiz room, a lecture room, a room containing the museum and the books of the Henry W. Oliver Chemical and Metallurgical Library, and three rooms for instructors.

The two balance rooms adjoin the quantitative labor-

atory and one of them may be entered from the qualitative laboratory.

The four large laboratories each have desk room for 48 students. Water and gas is supplied to each student and each room is supplied with air blast and electric current. They are well lighted, and heated by steam. The smaller laboratories are arranged for assaying, industrial work, gas analysis, microscopic and photographic work, and various other determinations made with the polariscope, spectroscope, calorimeter, etc. For this and other work properly belonging to the department, there is an adequate equipment.

SYNOPSIS OF STUDIES.

CHEMICAL COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911
GERMAN†.....	2	75
OR		
FRENCH‡.....	2	111
ENGLISH.....	2	I
DRAWING AND LETTERING.....	2	441
THE BIBLE	1	221
HYGIENE AND PHYSICAL CULTURE.....	1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	912
GERMAN.....	2	76† or 71‡
FRENCH.....	2	112‡ or 116†

*See pages 68-109.

†Entered on German.

‡Entered on French.

	Periods per week.	Course number.*
ENGLISH.....	2	2
PROJECTIONS AND LETTERING.....	2	442
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY.....	3	416
MENSURATION AND LOGARITHMS.....	2	421
CHEMISTRY.....	2	913
GERMAN.....	2	77† or 72‡
OR		
FRENCH.....	2	113‡ or 117‡
ENGLISH.....	2	3
DRAWING AND LETTERING.....	2	443
THE BIBLE.....	1	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY.....	3	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
CHEMISTRY.....	4	921
GERMAN.....	2	78† or 73‡
FRENCH.....	2	114‡ or 118‡
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2	444
THE BIBLE.....	1	224
THEMES.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
CHEMISTRY.....	7	922
GERMAN.....	2	79† or 74‡
FRENCH.....	2	115 or 119
ENGLISH.....	1	5
THE BIBLE.....	1	225
THEMES.		

*See pages 68-109.

†Entered on German.

‡Entered on French.

Third Term.

	Periods per week.	Course number.*
CHEMISTRY.....	6	923
PHYSICS.....	4	461
CHEMICAL ARITHMETIC.....	3	941
ORGANIC CHEMISTRY.....	2	924
THE BIBLE.....	1	226
THEMES.		

JUNIOR YEAR.

First Term.

PHYSICS.....	4	462
CRYSTALLOGRAPHY.....	2	511
QUANTITATIVE ANALYSIS.....	2	925
THEORETICAL CHEMISTRY.....	2	926
ORGANIC CHEMISTRY.....	2	927
METALLURGY.....	2	951
TECHNICAL GERMAN.....	1	961
BIBLE.....	1	233
THEMES.		

Second Term.

PHYSICS.....	4	463
PETROGRAPHY.....	2	512
QUANTITATIVE ANALYSIS.....	2	928
THEORETICAL CHEMISTRY.....	2	929
ORGANIC CHEMISTRY.....	2	930
METALLURGY.....	2	952
TECHNICAL GERMAN.....	1	962
BIBLE.....	1	234
THEME.		

Third Term.

QUANTITATIVE ANALYSIS.....	8	931
THEORETICAL CHEMISTRY.....	2	932
MINERALOGY.....	3	513
SANITARY BIOLOGY.....	2	561
TECHNICAL GERMAN.....	1	963
BIBLE.....	1	235
THEME.		

*See pages 68-109.

SENIOR YEAR.

First Term.

	Periods per week.	Course number.*
QUANTITATIVE ANALYSIS.....	10	933
CHEMICAL TECHNOLOGY.....	2	934
GEOLOGY.....	2	516
TECHNICAL GERMAN.....	1	964
BIBLE.....	1	242

Second Term.

ANALYTICAL CHEMISTRY (Thesis Work).....	6	971
CHEMICAL TECHNOLOGY.....	2	935
ASSAYING.....	2	955
GEOLOGY.....	2	517
POLITICAL ECONOMY.....	2	381
TECHNICAL GERMAN.....	1	965
BIBLE.....	1	243
THEME.		

Third Term.

ANALYTICAL CHEMISTRY (Thesis Work).....	14	972
TECHNICAL GERMAN.....	1	966
BIBLE.....	1	244

See pages 68-109.

COURSES.

ENGLISH LANGUAGE, ENGLISH LITERATURE,
COMPARATIVE PHILOLOGY.

Professors Francis A. March (Prof. Emeritus), F. A. March, Jr., J. W. Tupper, and Messrs. Farquhar, Burrowes and Barrick.

The work in this department aims first, to train the student in speaking and writing English correctly. This training begins with the daily theme work in the Freshman year and is continued throughout the course.

The work in the upper classes is divided into the study of the language and the study of the literature. Its purpose is the interpretation of masterpieces, the re-thinking of the thoughts of master minds. The study of the language consists of a study of the principles of grammar, rhetoric, etymology, phonetics, prosody and other material of philological investigation according to the progressive course outlined in Dr. March's *Method of Philological Study of the English Language* and the application of the results of such work to the text of some standard author. Bunyan, Spenser, Chaucer, Shakespeare, Bacon and Milton are taken up in this way, and courses in fiction, and the drama are given associated with an examination of the language of some novel or play. This course ends with the study of Dr. Whitney's *Lectures on Language*.

The work in English Literature consists of a course of lectures upon English Literature accompanied by special reading given during the Junior year and continued during the Senior year by a course in nineteenth century poetry.

Dr. March's Anglo-Saxon Grammar and Reader is used as the basis for a course in Anglo-Saxon given in connection with the study of the English language.

For training in speaking and writing English correctly every student is required to hand in two themes in every term of his College course after the Freshman year. Many of them are read in class and criticized as time allows. In this work professors of all departments take part. It is desired that students in each department shall write on subjects connected with it in the words and phases current among experts, and know the precise meaning of these words and phases. In these matters the professors in each department are authorities.

1-2-3. COMPOSITION AND RHETORIC.—Daily themes, including one criticism per week on assigned reading. Long themes and conferences every two weeks. First, second and third terms, Freshman year. Two periods per week.

The following is the program of the Freshman long themes and prescribed reading for 1908-'09.

First Term.

LONG THEMES.

Subject.	When due.
I. Who I am and why I came to Lafayette (500-1000 words).....	Oct. 5
II. How to make or do something (500-1000 words).....	Oct. 19
III. An exposition on a subject selected with the approval of the instructor (500-1000 words)...	Nov. 2
IV. An expression of opinion (500-1000 words).....	Nov. 16
V. A biographical portrait (1000-2000 words).....	Nov. 30

OUTSIDE READING.

General. Shakespeare, *As You Like It*; *Henry IV, Part I*; *Othello*.
 Sept. 17-Oct. 17. Macaulay, *History of England*, Chapter iii.
 Oct. 19-Nov. 14. L. B. R. Briggs, *School, College, and Character*.
 Nov. 16-Dec. 19. Macaulay, *Essay on Boswell's "Life of Johnson"*;
 Stevenson, *Thoreau* in "Familiar Studies of Men and Books"; Green,

A Short History of the English People, Part III, Chapter vii, Section, 3, "Elizabeth."

Second and Third Terms.

LONG THEMES.

	Subject.	When due.
VI.	Brief of Introduction to Argument.....	Jan. 25
VII.	Brief of Argument (2 to 3 pages).....	Feb. 8
VIII.	Argument (1000-1500 words).....	Feb. 23
IX.	Description (500-1000 words).....	Apr. 19
X.	Narrative (500-750 words).....	May 3
XI.	Narrative (750-1500 words).....	May 17

OUTSIDE READING.

General. Second term: Tennyson, *Geraint and Enid*, *Lancelot and Elaine*, *Guinevere*, *The Passing of Arthur*. Third term: Homer, *Odyssey* (Butcher and Lang's translation).

January. *Specimens of Argumentation*, ed. G. P. Baker.

February. Lincoln, *Letters and Speeches* ("Little Masterpieces" series, ed. Bliss Perry).

April. Stevenson, "A Night Among the Pines," from *Travels with a Donkey*; Kipling, *The Spring Running*; Ruskin, *Selections* ("Little Masterpieces" series), pp. 1-100.

May. Kipling, *The Man who would be King, without Benefit of Clergy*; *The Drums of the Fore and Aft*; Poe, *The Cask of Amontillado*, *The Gold Bug*; Stevenson, *The Merry Men*, *A Lodging for the Night*.

The text-book used during the entire course is Gardiner, Kittredge, and Arnold's *Manual of Composition and Rhetoric*. Nutter, Hersey and Greenough's *Specimens of Prose Composition* furnishes the materials for the study in the class-room of Exposition in the first term, Argumentation in the second term, and Description and Narration in the third term.

4. ENGLISH LITERATURE AND COMPOSITION.—Themes are handed in at each recitation. Conferences every two weeks. Study of Composition from Wendell's *English Composition*. The reading of Carlyle's *Heroes and Hero Worship*, Ruskin's *Sesame and Lilies*, and Arnold's *Essays*. First term, Sophomore year. Two periods per week.

5. ENGLISH LITERATURE AND COMPOSITION.—Continuation of Course 4. The reading of contemporary prose literature. Second term, Sophomore year. One period per week.
11. ANGLO-SAXON.—March's Anglo-Saxon Grammar and Reader. Second term, Sophomore year. Two periods per week.
- 12-13-14 ADVANCED ANGLO-SAXON.—Preparation: 11. March's Anglo-Saxon Grammar and Reader and additional reading as assigned. Gilbert Prize in Old English (see page 138). First, second and third terms, Senior year. One period per week.
15. ENGLISH LANGUAGE.—Trench on the Study of Words. Trench Prize (see page 136). First term, Sophomore year. Two periods per week.
16. ENGLISH LANGUAGE.—Bunyan's Pilgrim's Progress, English Syntax, Rhetorical Forms, Grammatical Equivalents, Essays on Bunyan's Life, Times and Works. First term, Sophomore year. Two periods per week.
17. ENGLISH LANGUAGE.—Spenser's Faery Queen, Etymology, Romance of Chivalry, Spenserian Stanza, Essays on Spenser's Life, Times and Works. Second term, Sophomore year. Two periods per week.
18. ENGLISH LANGUAGE.—Chaucer's Canterbury Tales, Phonetics, Orthographic Forms, Essays on Chaucer's Life, Times and Works. Lounsbury Prize (see page 136). Third term, Sophomore year. Four periods per week.
19. ENGLISH LANGUAGE.—Shakespeare: Study of Macbeth. Lectures, Weekly Essays on Shakespeare's Life, Times and Works. First term, Junior year. Four periods per week.
20. ENGLISH LANGUAGE.—Shakespeare: Study of Hamlet and other Shakespearean Tragedies. Lectures, Weekly Essays on Shakespeare's Dramatic Art. Second term, Junior year. Four periods per week.
21. ENGLISH LANGUAGE.—Study of Merchant of Venice and other Shakesperean Comedies. Lectures, Weekly reports, Dramatic Criticism. Shakespeare Prize (see page 139). Third term, Junior year. Four periods per week.
22. ENGLISH LANGUAGE.—English Fiction. Lectures, Assigned Reading, Book Criticism, Weekly Essays. First term, Senior year. Four periods per week.

23. ENGLISH LANGUAGE.—The English Drama. Lectures, Study of Jonson's "Every Man in His Humor." Weekly Essays on Jonson's Life, Times and Works. The Francis A. March Prize (see page 135). Second term, Senior year. Four periods per week.
24. ENGLISH LANGUAGE.—The English Drama. Study of Assigned Texts. Lectures. Weekly Reports. Third term, Senior year. Four periods per week.
- 30-31. COMPARATIVE PHILOLOGY.—Whitney's Language and the Study of Language. Third term, Senior year. Three periods per week.
- 41-42. SIXTEENTH AND SEVENTEENTH CENTURY LITERATURE.—Preparation: 3. Lectures, weekly reports, assigned reading. First and second terms, Junior year. Two periods per week.
43. EIGHTEENTH CENTURY LITERATURE.—Preparation: 3. Lectures, weekly reports, assigned reading. Third term, Junior year. Four periods per week.
44. THE ROMANTIC POETS, 1790-1832.—Preparation: 3. Lectures weekly reports, assigned reading. First term, Senior year. Four periods per week.
- 45-46. LATER NINETEENTH CENTURY POETS.—Preparation: 3. Lectures, weekly reports, assigned reading. Second and third term, Senior year. Four periods per week.

ELOCUTION.

Professor March, Jr.

- 51-52. ELOCUTION.—Delivering of selected pieces. Required in the Classical and Latin Scientific courses. Optional in all others. Second and third terms, Freshman year.
- 53-54-55. ELOCUTION.—Delivering of selected pieces. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First, second and third terms, Sophomore year.
- 56-57. ELOCUTION.—Delivering of selected pieces. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First and second terms, Junior year.

58. ELOCUTION.—Delivering of unwritten addresses on chosen subjects. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. Third term, Junior year.
- 59-60-61. ELOCUTION.—Delivering of unwritten addresses on assigned subjects. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First, second and third terms, Senior year.

GERMAN AND ROMANCE LANGUAGES.

Professor Raschen, Messrs. Hopkins, Hunt and Coulter.

GERMAN.

Der Deutsche Verein is an organization of students and officers interested in the study of German language and literature, and of German life and culture. Meetings are held fortnightly on Friday. Advanced students and others who desire to keep up their knowledge of German are invited. The programs consist chiefly of conversations, addresses and the singing of German songs.

Courses 71, 72, 73, 74 are prescribed for technical students who have entered on French.

71-72. ELEMENTS OF GERMAN.—Elements of Grammar and Syntax. Prose Composition followed by readings from *Ford's German for Sight Reading*. Second and third terms, Freshman year. Two periods per week.

73-74. INTERMEDIATE GERMAN.—Preparation: 72. Reading of more difficult narrative prose by Hauff, Eichendorff, Storm. First and second terms, Sophomore year. Two periods per week.

Courses 75, 76, 77, 78, 79 are prescribed for technical students who have entered on German.

75-76-77. GERMAN.—Preparation: Entrance German B.—Review of the principles of grammar, the reading of selections from modern writers, as Riehl, Wildenbruch, Fulda, etc., and the transla-

tion of easy scientific German. Cohn, *Die Chemie im Taglichen Leben*. First, second and third terms, Freshman year. Two periods per week.

- 78-79. GERMAN.—Translation of scientific treatises of an advanced character in German Science Reader. First and second terms, Sophomore year. Two periods per week.
80. ELEMENTS OF GERMAN.—Prescribed for Sophomores in the Classical Course. This Course in conjunction with Course 81 aims to give a thorough and accurate training in the rudiments of Grammar; to familiarize the student with spoken German as well as written; for this reason the inductive method will be employed, using German almost entirely from the beginning. In this manner the student is quickly made to acquire both "Sprachgefuehl" and "Sprachmaterial" so as to read German with ease. Composition and translation of easy graduated texts form part of the exercises each hour. Third term, Sophomore year. Two periods per week.
81. ELEMENTS OF GERMAN (Continued).—Prescribed for Juniors in the Classical Course. First term, Junior year. Three periods per week.
- 82-83. INTERMEDIATE GERMAN.—Preparation: 81. Reading of novels and dramas by modern writers such as Heyse, Keller, Fulda, Mörike, Sudermann. Second and third terms, Junior year. Two periods per week.
- 84-85-86. ADVANCED GERMAN.—Preparation: Entrance German A. Prescribed for Freshmen in the Latin Scientific Course. The study of accidence, syntax and etymology will form part of this Course. In connection with this, there will be oral practice in German and Composition as well as reading of advanced texts. These texts will be selected so as to vary the reading and to acquaint the student with a variety of style of German writers. In addition to this an easy text will be assigned for outside reading during the second and third terms. First, second and third terms, Freshman year. Four periods per week.

- 87-88. SELECTED WORKS OF LESSING.**—Preparation: 86. Prescribed for Sophomores in the Latin Scientific Course who have entered on German. This course provides for a study of the life of Lessing with parallel readings from his works. There will be occasional lectures on the literary, historical, and aesthetic aspects of the works studied. An English biography of Lessing will be used for reference. First and second terms, Sophomore year. Two periods per week.
- 89. HISTORICAL PROSE.**—Preparation: 88. Prescribed for Sophomores who have entered on German. Selected readings from German historical writers, and from addresses in the Reichstag. Third term, Sophomore year. Two periods per week.
- 90-91-92. SCHILLER AND GOETHE.**—Preparation: 89. The lives and several of the principal works of these authors will be studied. Lectures on the various aspects of these works are given to supplement these studies and readings in biography and criticism assigned. Elective. First, second and third terms, Junior year. Two periods per week.
- 93-94-95. GOETHE'S FAUST.**—Preparation: 92. Alternates with 96-98. The reading and interpretation of Faust, the First Part in its entirety, the Second Part in selected portions. The study will comprise its genesis, significance, ethics, and artistic character. It is open to those who completed the course on Goethe. Elective. First, second and third terms, Junior year. Two periods per week.
- 96-97-98. HISTORY OF THE GERMAN DRAMA OF THE 19TH CENTURY.**—Preparation: 87-89. The reading and criticism of the various types of modern drama together with a study of their sources and influence. (Alternates with 93-95; not given in 1910.) Elective. First, second and third terms, Junior year. Two periods per week.
- 99-100-101. HISTORY OF GERMAN LITERATURE;** from the earliest beginnings to the end of the Eighteenth Century.—Preparation: 87-89 or 90-92. Lectures and collateral reading and study of the literary movements in Germany. First, second and third terms, Senior year. Two periods per week.

FRENCH.

Courses 111, 112, 113, 114, 115 are prescribed for technical students who have entered on French.

- 111-12-13. FRENCH.—Preparation: Entrance French B. Readings of scientific treatises and standard authors. First, second and third terms, Freshman year. Two periods per week.
- 114-15. FRENCH.—Readings from the classics. First and second terms, Sophomore year. Two periods per week.
- Courses 116, 117, 118, 119 are prescribed for technical students who have entered on German.
- 116-117. ELEMENTS OF FRENCH.—Grammar (Aldrich and Foster's Foundations of French). Reading of Lazare's Lectures Faciles. Composition. Second and third terms, Freshman year. Two periods per week.
- 118-19. INTERMEDIATE FRENCH.—A continuation of 117. Reading from modern standard authors, Labiche and Verne, and translations from Dike's Scientific French Reader. First and second terms, Sophomore year. Two periods per week.
126. ELEMENTARY FRENCH.—Prescribed for Sophomores in the Classical and Latin Scientific courses. Fraser and Squair's Grammar; composition; sight reading and translation of easy prose; careful drill in pronunciation. First term, Sophomore year. Two periods per week.
127. FRENCH.—Continuation of foregoing; thorough study of irregular verbs; grammar; composition; translation and sight-reading of more difficult prose selections from Lazare's Premières Lectures or selected stories from Dumas fils, Halévy, Lavedan, etc. Second term, Sophomore year. Two periods per week.
128. FRENCH.—Grammar and composition continued; translation and sight-reading from Guerlac's Standard French Authors; discussion of the various works of the authors represented. Third term, Sophomore year. Two periods per week.
129. FRENCH.—Readings in French history from Lavisse's Histoire de France; discussions. First term, Junior year. Two periods per week.
130. FRENCH.—The Novel. Selections from Dumas' Les Trois Mousquetaires or Hugo's Notre Dame. Second term, Junior year. Two periods per week.
131. FRENCH.—The School of the Realists. Readings from Zola's Débacle. Collateral reading in History of French Literature. Third term, Junior year. Two periods per week.

132. FRENCH.—The Classical Drama—Tragedy. Study of the works of Corneille, Racine and Rotrou. Lectures. First term, Senior year. Two periods per week.
133. FRENCH.—The Classical Drama—Comedy. Works of Molière. Second term, Senior year. Two periods per week.
134. FRENCH.—Rise of the Romantic School. Hugo's Ruy Blas or Hernani. Third term, Senior year. Two periods per week.
135. FRENCH.—The Literature of the XVIth Century. Selections from Ronsard, Marguerite de Valois, Marot, Jodelle, etc. The Pléiade. Alternates with 133. Second term, Senior year. Two periods per week.
136. FRENCH.—Historical Grammar. Development of French from Latin. Alternates with 133-134. Third term, Senior year. Two periods per week.

SPANISH.

141. SPANISH.—This course is designed to give the elements of Spanish grammar, and to enable the student to translate easy prose from English into Spanish and *vice versa*. Optional for all students. Second term, Junior year. Two periods per week.
142. SPANISH.—Continuation of 141. Third term, Junior year. Two periods per week.

ITALIAN.

151. ITALIAN.—Elements of Italian grammar. Translation of prose from Italian into English and *vice versa*. Optional for all students. Second term, Junior year. Two periods per week.
152. ITALIAN.—Continuation of 151. Third term, Junior year. Two periods per week.

THE GREEK LANGUAGE AND LITERATURE.

Professor Youngman and Mr. Hunt.

The aim of the Greek Course is to be thoroughly grounded in Greek forms, idioms, and syntax—to learn the composition of words, the formation of phrases, and the construction of sentences. In the earlier part of the course there is a daily lesson in the grammar, with a test of the student's ability to apply it to the text just

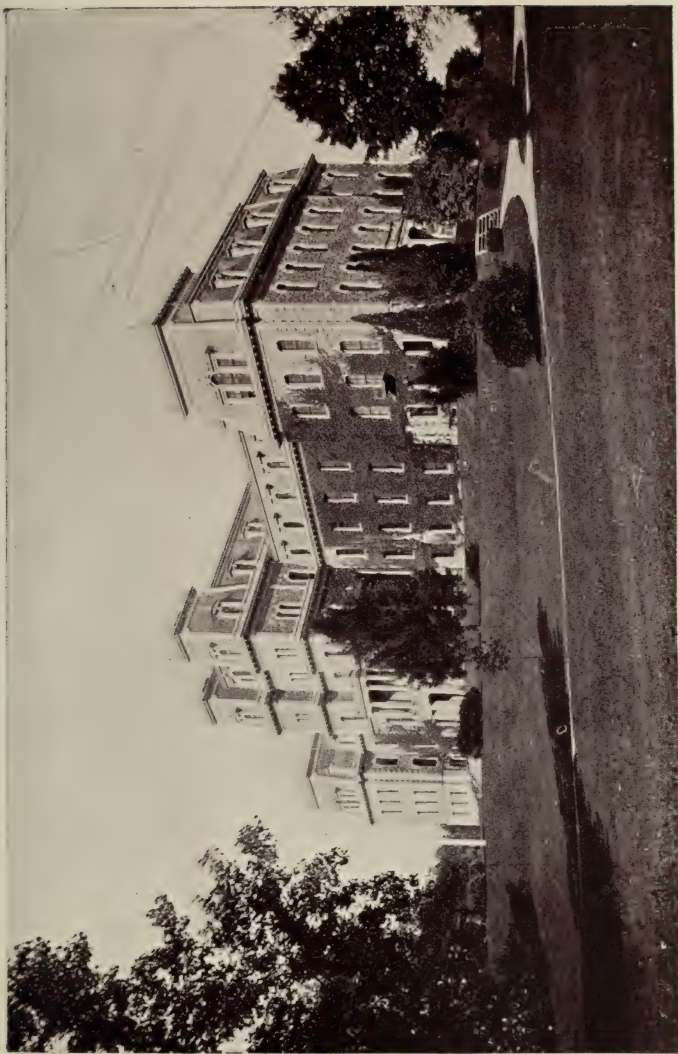
read. Etymologies and English derivatives are constantly called for.

The best passages of representative authors are translated into the best attainable English. In poetry there is a study of Homer, Sophocles, and Aristophanes; in prose, of Herodotus, for history; of Aeschines and Demosthenes, for oratory. For ethical questions there is a study of Socrates in the *Memorabilia* and the *Apology*.

Attention is directed to Greek life, education, faith, religion, and habits of thought and expression, as compared with our own. The old Greek citizen and the modern American citizen are brought face to face.

Essays are also called for, giving the results of the student's researches. When *De Corona* is read there is a special class debate on the relations of Aeschines and Demosthenes with Philip. When Homer is read there are references to the Bible for comparison of faith, religion, and forms of expression. There is an attempt to bring the students to an intelligent appreciation of the beauty and grace and force in Greek literature, to cultivate the taste, regulate the heart, and discipline the mind.

161. XENOPHON—MEMORABILIA.—Selections; prose composition and classical Geography. First term, Freshman year. Four periods per week.
162. HERODOTUS.—Selections; old Greek Life. Second term, Freshman year. Four periods per week.
163. HOMER—THE ILIAD.—Selections from the first six books; Greek literature. Third term, Freshman year. Four periods per week.
164. HOMER—THE ILIAD.—Selections from books 18 to 24; Homer and the Bible compared. First term, Sophomore year. Four periods per week.



PARDEE HALL.

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165. AESCHINES AGAINST CTESIPHON—GREEK HISTORY.—General. Second term, Sophomore year. Four periods per week.
166. DEMOSTHENES ON THE CROWN—GREEK HISTORY.—Period of Demosthenes. Philip and Alexander. Third term, Sophomore year. Four periods per week.
167. PLATO.—The Apology and Crito. Introduction to Greek Philosophy. Elective. First term, Junior year. Four periods per week.
168. GREEK TRAGEDY.—Elective. Sophocles-Aedipens Rex. Study of the Ancient and Modern Theatre. Second term, Junior year. Two periods per week.
169. GREEK COMEDY—ARISTOPHANES' CLOUDS.—History of Greek Comedy. Elective. Third term, Junior year. Two periods per week.
170. SELECTED AUTHORS.—Elective. First term, Senior year. Two periods per week.
171. SELECTED AUTHORS.—Elective. Second term, Senior year. Two periods per week.
172. SELECTED AUTHORS.—Elective. Third term, Senior year. Two periods per week.

THE LATIN LANGUAGE AND LITERATURE.

Professor Owen and Mr. Gates.

It is the aim of this Department to give the students an intelligent acquaintance with the language, literature, and institutions of Rome, and qualify them for the efficient treatment of these subjects as teachers, or for the further scholarly pursuit of these and kindred studies after graduation if they should be so disposed. An effort is made to unite accuracy in details with facility in reading within the limits of a reasonable range.

It is kept in mind, also, that the training in this Department should be practically helpful and valuable to those who are to speak and write the English language. With a view to cultivate the power of expression, be-

sides the oral work of the class-room, there are frequent exercises in writing, in which it is sought to faithfully render the author into the English of our literary standards.

181. LIVY.—Books No. XXI–XXII, with Roman History and Latin Prose. First term, Freshman year. Four periods per week.
182. HORACE.—Odes and Epods. Latin Prose. Second term, Freshman year. Four periods per week.
183. HORACE.—Satires and Letters with Roman Antiquities. Third term, Freshman year. Four periods per week.
184. CICERO.—De Oratore with history of the last Century of the Roman Republic. First term, Sophomore year. Four periods per week.
185. LATIN HYMNS.—Latin Hymns with Early Roman Literature. Second term, Sophomore year. Four periods per week.
186. CICERO.—De Officiis. Third term, Sophomore year. Two periods per week.
187. TACITUS.—Agricola and Germania. Roman Literature of the Silver Age. First term, Junior year. Two periods per week.
188. JUVENAL.—Roman Archaeology, illustrated by an Extensive Collection of Roman photographs. Second term, Junior year. Two periods per week.
189. TACITUS.—Annals. Third term, Junior year. Two periods per week.
190. LUCRETIUS.—First term, Senior year. Two periods per week.
191. EPISTOLARY LATIN.—Pliny and Cicero. Second term, Senior year. Two periods per week.
192. INSCRIPTIONS.—Third term, Senior year. Two periods per week.

THE HEBREW LANGUAGE.

Rev. Robert Robinson.

201. ELEMENTARY HEBREW.—Etymological principles of Hebrew; inflexions and laws of euphonic changes. Elective. Second term, Senior year. Two periods per week.

202. HEBREW (Continued).—Translation of portions of Old Testament History from Hebrew into English, and from English into Hebrew. Elective. Third term, Senior year. Two periods per week.

THE BIBLE.

The President, Professors Youngman, Hardy, Owen, Mecklin, Raschen, Roberts, Lyle, and Messrs. Smith, Colli-ton, Hopkins, Marquard, Gates, Burrowes and Coulter.

In the Freshman year a general survey of the Bible will be made with the purpose of impressing upon the students the character of its contents, the various books and their relation to the whole, and familiarizing them with its actual language and ideas. So far as may be profitable for this dominant purpose instruction will be given in Bible history and geography, but the great object is to make the student familiar with the very words of the English Bible.

From 1909-'10 the Sophomore year will be devoted to a detailed study of one of the synoptic gospels. Those who study Greek will use the Greek Testament; those taking the Latin Scientific course, a Latin version and the Technical students will use a French version. In the Junior year the Acts of the Apostles will follow. But for those who have had the Acts the course will be as at present, a study of the life of Christ in one of the gospels.

Beginning with September, 1910, the Acts of the Apostles will be studied in the Junior year. Special attention will be given to the lives and labors of the Apostles and the founding of the Christian Church.

In the Senior year the first half year will be devoted to a course on the early history of Christianity in which Uhlhorn's Conflict of Christianity with Heathenism will be the text book; the second half to the external history of the English Bible, its translators and translations.

- 221-22-23. THE BIBLE.—General survey of the Old Testament and the Life of Christ. Required of all students throughout the Freshman year. One period per week.
- 224-25-26. THE NEW TESTAMENT.—The Acts of the Apostles, in French. Required of Technical students throughout the Sophomore year. One period per week.
- 227-28-29. THE NEW TESTAMENT.—The Acts of the Apostles in Greek. Required of Classical students throughout the Sophomore year. One period per week.
- 230-31-32. THE NEW TESTAMENT.—The Acts of the Apostles in Latin. Required of Latin Scientific students throughout the Sophomore year. One period per week.
- 233-34-35. THE NEW TESTAMENT.—Study of the Gospels in German. Required of Technical and General Scientific students throughout the Junior year. One period per week.
- 236-37-38. THE NEW TESTAMENT.—Study of the Gospel in the Greek. Required of Classical students throughout the Junior year. One period per week.
- 239-40-41. THE NEW TESTAMENT.—Study of the Gospels in Latin. Required of Latin Scientific students throughout the Junior year. One period per week.
- 242-43. CHURCH HISTORY.—Uhlhorn's Conflict of Christianity and Heathenism. Required of all students. First and second terms, Senior year. One period per week.
244. HISTORY OF THE ENGLISH BIBLE.—Required of all students. Third term, Senior year. One period per week.

PHILOSOPHY.

Professor Mecklin.

The course in Philosophy is designed to be continuous from the beginning of the second term Junior to the end

of the Senior year and consists of both required and elective work. The following is a synopsis of the course:

- 251-52. PSYCHOLOGY.**—Lectures and parallel reading. Text-book, Angell's Psychology. Second and third terms, Junior year. Three periods per week second term and two third term.
- 253. ADVANCED PSYCHOLOGY.**—Preparation: 251-252. Child Psychology, lectures and parallel reading. Elective. First term, Senior. Two periods per week.
- 271. LOGIC.**—Text-book, Creighton's Logic. Third term, Junior year. Two periods per week.
- 281. ETHICS.**—Preparation: 251-252. Parallel reading Kant's Ethics, Mill's Utilitarianism and Muirhead's Elements of Ethics. First term, Senior year. Three periods per week.
- 291-92. HISTORY OF PHILOSOPHY.**—Preparation: 251-252. Lectures and text-book, three periods weekly second term, and two periods third term, Senior year. Text-book, Weber or Rogers. Assigned parallel reading in Descartes, Leibnitz, Locke, Berkeley, Hume and Kant.
- 301-302. HISTORY OF EDUCATION.**—Preparation: 251-252. Text-book, Monroe, History of Education, Bagley, Educative Process, parallel reading. Elective, second and third terms, Senior year. Two periods per week.

HISTORY, POLITICAL AND SOCIAL SCIENCE.

The President and Professors Youngman, Owen and Roberts.

The work of this department is designed to give such a general knowledge of History and Political Science as belongs to a liberal education. At the same time sufficient work is offered in the electives to prepare those students who desire to take up graduate work, or to engage in the practice of law or the public service, or teaching. The instruction is given by text-book, by lectures, and by library references, the students reporting the results of their reading partly during the regular work of the

class, and partly in the form of essays. The subjects covered by the course are in detail as follows:

311. ANCIENT HISTORY.—Survey of the history of Greece and Rome in connection with the courses in Latin and Greek. Political, Social, literary and philosophical history of each epoch. Classical Geography.
- 321-22. HISTORY OF ENGLAND.—The narrative history of England is made the basis of study, but especial attention is given to the economic, social and intellectual history of the country, and to the development of English institutions. The general aim of this course, in its method, is to prepare for the courses in American History. Greene's Short History of the English People is used as a text-book, and the importance of collateral readings is emphasized. First and second terms, Junior year. Two periods per week.
331. AMERICAN HISTORY.—The course in Colonial History is intended to trace the beginnings of the American nation rather than the details of the history of the individual colonies. Emphasis is therefore laid on the European inheritance brought to this country by the colonists, the development of American institutions in the new environment, the expansion of population, the struggle between France and England for North America, the underlying causes of the Revolution, the growth of independence and union. Thwaite's The Colonies and Hart's Formation of the Union are used as text-books, supplemented by lectures, reading and reports. Second term, Junior year. Two periods per week.
351. CONSTITUTIONAL HISTORY.—The United States. A required course dealing with the Constitution from the point of view of its historical development. Fiske's Critical Period of American History is used as an introduction to this course, and it is accompanied by a critical study of several important constitutional documents, such as Magna Charta, the Petition of Rights, the Articles of Confederation, and the Ordinance of 1787. Then the Constitution is taken up section by section and studied with reference to its historical development and its subsequent interpretation and construction. Third term, Junior year. Two periods per week.

- 352-53. CONSTITUTIONAL HISTORY.—The United States (Continued). Preparation: 351. Detailed study of the subject, with Bryce's *American Commonwealth* as an introduction and general guide. Lectures, discussions and written reports on questions of American citizenship. Elective. Second and third terms, Senior year. Two periods per week.
- 361-62-63. GENERAL CONSTITUTIONAL HISTORY.—A course in General Constitutional History is begun as a required course in the first term of the Senior year and continued as an elective through the second and third terms. It begins with the origin of the State, and following the plan of Woodrow Wilson's *The State*, pursues the development down to the present time. The recitations are supplemented by lectures and reading, with written reports of investigations. Two periods per week.
- 371-72. LAW.—Elective courses in Blackstone's Commentaries. Second and third terms, Senior year. Two periods per week.
376. INTERNATIONAL LAW.—The course in International Law undertakes to do little more than to exhibit the fundamental principles which govern international affairs, and by the study of a few important cases to show the method of diplomatic procedure. It is especially intended to give the students the information needed to understand current discussions of foreign relations. Text-book—Lawrence's *Principles of International Law*. Two periods per week. First term, Senior year. Two periods per week.
- 381-82. POLITICAL ECONOMY.—The course in Political Economy consists of a rapid survey of the principles during second term Senior year, and of the discussion of practical applications of economic theories during the third term. Special attention, however, is given to the questions which are vital issues of the day, such as Finance and the Tariff. The utmost care is taken to avoid the teaching of party politics under the guise of Economic Science. At the same time the teaching in this Department recognizes the importance of inculcating honest views on the money question and the right of American citizens to know what can be said for the American policy of Protection both in the abstract and in its actual workings. Two periods per week.

391. SOCIOLOGY.—Preparation: Required studies of Junior year, and first term Senior year. This course is designed to prepare the student for intelligent study of the practical problems of modern society. An analysis of the major forces in the organization of modern society, with some account of the proper relation of the social sciences is attempted. This is followed by an outline study of the great institutions of civilization, their origin and development. The particular study of typical social problems completes the course. Lectures and dictation are supplemented by the use of Wright's Practical Sociology, reports and discussions. Elective, second term, Senior year. Two periods per week.

MATHEMATICS.

Professors Hardy and Hall, and Messrs. Brasefield, Smith, Colliton, Marquard and Hillyer.

It is strongly recommended that algebra be thoroughly reviewed just before admission to college.

401. ALGEBRA.—Binomial theorem, theory of logarithms, probability, variables and limits, series and theory of equations. Text-book—Wentworth's College Algebra. First term, Freshman year. Four periods per week.
402. ALGEBRA.—Preparation: Entrance Mathematics B. Through Ratio, Proportion and Variation. First term, Freshman year. Two periods per week.
403. ALGEBRA COMPLETED.—Preparation: 402. (Continuation of 402.) Second term, Freshman year. Two periods per week.
404. ALGEBRA.—To Progressions. Second term, Freshman year. Four periods per week.
405. ALGEBRA COMPLETED.—(Continuation of 404.) Third term, Freshman year. Four periods per week.
406. GEOMETRY.—Solid Geometry. First term, Freshman year. Two periods per week.
407. GEOMETRY.—Solid Geometry. First term, Freshman year. Four periods per week.
411. TRIGONOMETRY.—The work in this course begins with a rapid review of the elementary Plane Trigonometry. Then follows the advanced Plane Trigonometry, consisting of deri-



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vation of formulas and trigonometrical series, solution of right—and oblique-angled triangles and solution of problems involving the practical applications. About one-third of the term is devoted to Solid Trigonometry which is also completed. Text-book—Crawley's Trigonometry. Second term, Freshman year. Five periods per week.

412. TRIGONOMETRY.—Preparation: 403, 406. Third term, Freshman year. Four periods per week.
413. TRIGONOMETRY.—Preparation: 405-406. First term, Sophomore year. Four periods per week.
416. ANALYTICAL GEOMETRY.—The work in this subject consists of the Analytical Geometry of two dimensions, including the point, right line and circle; the conics, tangents, diameters, transformation of coordinates, the general equation of the second degree and higher plane curves; also the Analytical Geometry of three dimensions, including the point, the plane and surfaces of revolution. Text-book—Ashton's Analytic Geometry. Third term, Freshman year. Three periods per week.
417. ANALYTICAL GEOMETRY (Continued).—First term, Sophomore year. Two periods per week.
418. ANALYTIC GEOMETRY.—Preparation: 412. Drawing of curves from their equations; accurate demonstration of propositions. First term, Sophomore year. Four periods per week.
419. ANALYTIC GEOMETRY.—Preparation: 418. (Continuation of 418.) Four periods per week. Second term Sophomore year. Four periods per week.
420. ANALYTIC GEOMETRY.—Preparation: 413. Same as 418. Second term, Sophomore year. Four periods per week.
421. MENSURATION AND LOGARITHMS.—The work includes the mensuration of the ordinary geometrical magnitudes, conic sections and curved surfaces and solids. The prismoidal formula, Simpson's rule, etc., are given. Much practice is given in logarithmic computations in problems relating to Physics, Mechanics and Engineering. Text-book—Hall's Mensuration. Third term, Freshman year. Two periods per week.

426. DIFFERENTIAL AND INTEGRAL CALCULUS.—The work in the Differential Calculus consists of the differentiation of all the functions of one or more variables, successive differentiation, implicit functions, development of function, evaluation of indeterminate forms, maxima and minima, properties of curves and radius of curvature, together with numerous practical applications in Mechanics. In the Integral Calculus are treated the integration of rational, irrational and transcendental functions, integration by parts and successive integration, rectification of curves, quadrature of plane surfaces, surfaces and volumes of solids, centers of gravity of lines, surfaces and solids, and moments of inertia. Text-book—Hall's Differential and Integral Calculus. First term, Sophomore year. Three periods per week.
427. DIFFERENTIAL AND INTEGRAL CALCULUS (Continued).—Second term, Sophomore year. Five periods per week.
429. DIFFERENTIAL CALCULUS.—Preparation: 419-420. Elective. First term, Junior year. Four periods per week.
430. INTEGRAL CALCULUS.—Preparation: 429. Elective. Second term, Junior year. Four periods per week.
431. CALCULUS.—Preparation: 430. Application of the Calculus to the study of Loci. Elective. Third term, Junior year. Four periods per week.
432. DIFFERENTIAL EQUATIONS.—Preparation: 431. Elective. First term, Senior year. Two periods per week.
- 433-34. THEORY OF FUNCTIONS.—Preparation: 432. Elective. Second and third terms, Senior year. Two periods per week.
436. LEAST SQUARES.—Law of probability of error, adjustment of observations, precision of observations and empirical formulas. The problems are selected with particular attention to the needs of engineers. Text-book—Merriman's Least Squares. Third term, Sophomore year. Three periods per week, for half term.
437. DIFFERENTIAL EQUATIONS.—In this subject are given the principal differential equations of the first order and degree and those of the second order that are of importance in the applied mathematics that follow. Text-book—Hall's Differential and Integral Calculus. Third term, Sophomore year. Two periods per week, for half term.

DRAWING AND DESCRIPTIVE GEOMETRY.

Professor Hall, and Messrs. Brasefield, Colliton, Marquard and Hillyer.

441. DRAWING AND LETTERING.—Use and testing of drawing instruments and materials; construction of plane geometrical problems; pen and brush shading and tinting; engineering conventions; lettering. First term, Freshman year. Two periods per week.
442. PROJECTIONS AND LETTERING.—Orthographic, isometric and clinographic projections; sketching; free-hand lettering. Faunce, Reinhardt. Second term, Freshman year. Two periods per week.
443. DRAWING AND LETTERING.—Shades and shadows; working drawings with tracings and blue-prints; free-hand lettering. Text-books—Faunce's Elements of Mechanical Drawing and Reinhardt's Lettering. Third term, Freshman year. Two periods per week.
444. DESCRIPTIVE GEOMETRY.—Problems on the point, line and plane. Text-book—Hall's Descriptive Geometry. First term, Sophomore year. Two periods per week.
445. DESCRIPTIVE GEOMETRY.—Single curved surfaces; double curved surfaces; intersections and developments; perspective and graphical solutions of problems in Machine Drawing, Surveying, Architecture, etc. Text-book—Hall's Descriptive; Geometry. Second term, Sophomore year. Three periods per week.
446. MACHINE DRAWING.—Detailed working-drawings with tracings and blue-prints of screws, joints, gear-wheels, engine parts, etc., are made. The object is to qualify the students to read working-drawings readily and to construct them according to approved practice and to be able to apply the elements of machine design. Reid and Reid. Third term, Sophomore year. Two periods per week.
447. MACHINE DESIGN.—Application of the principles of Mechanics of Materials to the design and drawing of riveted joints, couplings, bolts, keys, cutters, shafting, journals, pipes, spur and bevel gears, belts, pulleys, wire rope gearing, chains, tanks

512. **PETROGRAPHY.**—A large collection of hand specimens of rocks with thin sections are used in this study. Text-book—Kemp's Handbook of Rocks. Second term, Junior year. Two periods per week.
513. **MINERALOGY.**—A systematic review of mineral species, more special attention being paid to their chemical and crystallographic relations and to their mode of occurrence in nature. Instruction is given by lectures which are illustrated by a study collection consisting of some two thousand specimens, including the most important species. A course in determinative mineralogy supplements these lectures. The student is required to determine sixty minerals and to write out a description of each. Third term, Junior year. Three periods per week.
516. **GENERAL GEOLOGY.**—Dynamical, Structural and Physiological Geology. The work of the class-room is supplemented by excursions into the neighboring region, and sufficient time is devoted to field work to enable each student to construct a six-inch section up and down the Delaware River at Easton. Text-book—Scott's Introduction to Geology. First term, Senior year. Two periods per week.
517. **GENERAL GEOLOGY.**—Continuation of Course 516. Historical Geology. Accumulations, organic and inorganic, which are of economic importance. Text-book—Scott's Introduction to Geology. Second term, Senior year. Two periods per week.
521. **MINING GEOLOGY. ECONOMIC GEOLOGY.**—Practical geology of the metalliferous deposits. This is a lecture course, but reading is assigned in the following works: "Economic Geology of United States," Ries; "Ore Deposits of the United States and Canada," Kemp; "The Nature of Ore Deposits," Beck; etc. Third term, Senior year. Two periods per week.
522. **MINING GEOLOGY. FIELD GEOLOGY.**—In this course the student makes a detailed field study of an area, from which he constructs a colored geological map and geological sections. Specimens of the different ores are collected and then sections are cut for microscopical examination. Third term, Senior year. Two periods per week.

523. MINING GEOLOGY.—Elective. First term, Senior year. Two periods per week.
524. MINING GEOLOGY.—Elective. Second term, Senior year. Two periods per week.

ASTRONOMY.

Professor Hardy and Mr. Smith.

531. DESCRIPTIVE ASTRONOMY.—Fundamental definitions of the celestial sphere, parallax, refraction, the earth as an astronomical body, the sun, the moon, eclipses and the planets. Text-book—Young's Astronomy. First term, Senior year. Two periods per week.
536. DESCRIPTIVE ASTRONOMY.—More detailed course than 531. First term, Senior year. Four periods per week.
- 541-42. PRACTICAL ASTRONOMY.—The use of the sextant in determining time by a single altitude of the sun, by a single altitude of a star, by equal altitudes of the sun, by equal altitudes of a star; in determining latitude by the meridian altitude of a star in any position, by circummeridian altitudes; and in determining longitude by lunar distances. The instrumental constants of the transit instrument and its use in determining longitude. The use of the zenith telescope in determining latitude. The sections of the class are made so small that each student gets considerable practice with the instruments. Second and third terms, Senior year. Two periods per week.

BIOLOGY.

Professor Davison and Mr. Foster.

The work of this Department occupies all of the ten rooms in Jenks Biological Hall. A general laboratory, forty by sixty feet, and four special laboratories well equipped with twentieth century apparatus, in addition to an herbarium and vivarium, provide ample facilities for pursuing practical studies on plant and animal life.

The courses in Biology, excepting Sanitary Biology

required for the Civil Engineers, are elective only, and consist of work throughout the Junior and Senior years. They are open for election to Classical, Latin Scientific, and General Scientific students. In order to meet the double purpose of a professional preparation and general culture, the courses are so arranged as to provide in each the special knowledge required without sacrificing the ends of general culture and discipline, which is sought in all the undergraduate courses. Those not wishing to take the complete course, and yet desiring to know the meaning of the life forms, the relation of plants and animals to one another and especially to man, and to understand the factors and methods of evolution, should pursue the work throughout the Junior year. One may, however, begin his biological studies at any time prior to the second term of the Senior year. The work of the second and third terms of the Senior years is designed for those expecting to enter the professions of teaching or medicine.

551. MAMMALIAN ANATOMY.—Structure of the body; evidence of evolution of animals; dissection; the nervous system; introduction to natural history of the highest group of vertebrates. Elective. First term, Junior year. Two periods per week.
552. VERTEBRATE ZOOLOGY.—Evolution of the various organs and systems; origin and development of certain forms of animals; habits and natural history. Elective. Second term, Junior year. Four periods per week.
553. GENERAL BIOLOGY.—Morphology and life history of invertebrates; Darwinism, parasitism, etc. Elective. Third term, Junior year. Four periods per week.
554. BACTERIOLOGY AND HYGIENE.—Preparation: 551, 553 or 551. Form, habit and use of bacteria; cause and prevention of disease; disinfection, disposal of sewage, sanitary analysis of water. Elective. First term, Senior year. Four periods per week.

555. **PHYSIOLOGY.**—Preparation: 551, 553 or 554. Microscopic study of the chief organs of man; physiological problems relating to the various systems. Elective. Second term, Senior year. Four periods per week.
556. **EMBRYOLOGY AND HISTOLOGY.**—Preparation: 551 or 552 and 555. Origin and early development of embryonic life; cytology, etc.; preparation of material for microscopic work. Elective. Third term, Senior year. Four periods per week.
561. **SANITARY BIOLOGY.**—The cause and prevention of disease; the rôle of bacteria in the septic tank; the effect of polluted water on health; biological analysis of water. The Biological Laboratory is used by students in this course prior to their work in Water Supply and Sewerage. It contains equipment fitted for the study of Sanitary Biology, *viz.*, twenty compound microscopes, a dozen aquaria, several sets of Sedgwick-Rafter apparatus, modern sand and house filters, drying ovens, sterilizers, incubators, fermentation tubes, petri dishes, etc., furnishing the necessary facilities for a practical study of the algae aquatic animals and bacteria relating to sewage disposal and water supply. Required for Civil Engineers and Chemists. Elective for others. Third term, Junior year. Two periods per week.
571. **BOTANY.**—Excellent advantages for pursuing this branch are offered by the well-equipped laboratory and extensive College Herbarium containing representatives of nearly all the mosses, ferns and flowering plants found in Pennsylvania in addition to hundreds of species from other regions of North America. In its creation Dr. Porter was actively engaged for nearly half a century. It was gradually built up by personal collection, gift, exchange, and purchase, and well represents the growth of this branch of the science in the United States during this period of time. It contains the type-specimens of the species described by him. A library, also, rich in the literature pertaining to the subject, has been accumulated in the same way, and the letters received in correspondence with distinguished naturalists have been preserved. Morphology and life history of the lower plants; physiological processes in plants; evolution of species. Elective. First term, Junior year. Two periods per week.

HYGIENE AND PHYSICAL CULTURE.

Dr. Updegrove and Mr. Butterworth.

580. Lectures on Health and the general principles of Physiology and Anatomy illustrated by diagrams.
 PHYSICAL CULTURE.—First aid to the injured. First term, Freshman year. One period per week. Gymnasium drills. Freshman and Sophomore years. Four exercises per week.

CIVIL ENGINEERING.

Professors Porter and Lyle and Messrs. Miner, Goldbeck and Thoroughgood.

601. SURVEYING.—Chain, compass and transit surveying. Leveling, topographical drafting. Text-book—Breed and Hosmer's Plane Surveying. Third term, Freshman year. Two periods per week.
602. SUMMER SCHOOL.—Field problems in use of chain, level and transit. Survey of College Campus. Map. Area computations. Three weeks in vacation at end of Freshman year.
603. SURVEYING.—Trigonometric and barometric leveling. Use of plane-table, sextant and solar transit. Hydrographic surveying. Topographic drafting. Text-book—Breed and Hosmer's Higher Surveying. First term, Sophomore year. Two periods per week.
611. RAILROADS.—Simple, reverse, compound, vertical and transition curves. Drafting. Text-book—Allen's Railroad Curves and Earthwork. Second term, Sophomore year. Two periods per week.
612. RAILROADS.—Turnouts, cross-overs, earthwork. Paper location of railroad. Estimate of cost. Drafting. Text-book—Allen's Railroad Curves and Earthwork. Third term, Sophomore year. Two periods per week.
613. SUMMER SCHOOL.—Railroad reconnaissance. Preliminary and final location. Cross-sectioning. Map. Three weeks in vacation at end of Sophomore year.
614. RAILROADS.—Computation of earthwork from notes of Summer School Survey. Maintenance of roadbed and track. Maintenance tools and appliances. Drafting. Text-book—Camp's Notes on Track. First term, Junior year. Three periods per week.

615. RAILROADS.—Economic location. Traffic. Operating expenses. Cars and locomotives. Virtual grades. Text-book Webb's Economics of Railroad Construction. Second term, Junior year. Two periods per week.
616. RAILROADS.—Economic problems. Transportation. Management. Design. Terminals, signals and railroad structures. Third term, Junior year. Two periods per week.
621. ELEMENTARY MECHANICS.—Composition and resolution of forces, center of gravity, simple machines, etc. Text-book—Maurer's Mechanics. Third term, Sophomore year. Two periods per week.
622. APPLIED MECHANICS.—STATICS. Principles of equilibrium and their application to flexible cords, tackle, jointed structures, friction, moment of inertia. KINEMATICS. Rectilinear motion, curvilinear motion, harmonic motion. Motion of a rigid body, translation, rotation, plane motion. Text-book—Maurer's Mechanics. First term, Junior year. Four periods per week.
623. APPLIED MECHANICS. KINETICS.—Motion of a particle, translation of a rigid body, rotation, plane motion of a rigid body, work and energy, impulse and momentum. Second term, Junior year. Four periods per week.
624. MECHANICS OF MATERIALS.—RECITATIONS. The principles of stress and strain; the behavior of materials under tension, compression and shearing; investigation and design of pipes, riveted joints, boilers and standpipes; strength and flexure of simple and cantilever beams. Report on the carrying capacity of a floor. Text-book—Merriman's Mechanics of Materials. LABORATORY. Study and use of testing machines. Commercial tension tests of iron and steel. Modulus of elasticity in tension and compression and shear tests of iron, steel and wood. First term, Junior year. Two periods per week.
625. MECHANICS OF MATERIALS.—RECITATIONS. Restrained and continuous beams; columns; shafts; reinforced concrete. Design of an I-beam highway bridge and of a steel standpipe. Text-book—Merriman's Mechanics of Materials. LABORATORY.

Transverse tests of cast iron and wood; modulus of elasticity of steel in bending; tests of wooden columns; torsion tests of iron and steel; calibration of testing machines; modulus of elasticity of concrete; reinforced concrete beams. Second term, Junior year. Three periods per week.

626. MECHANICS OF MATERIALS.—Impact and fatigue; true and internal stresses; mathematical theory of elasticity. Design of a reinforced concrete floor. Text-book—Merriman's *Mechanics of Materials*. Third term, Junior year. Two periods per week.

627. MECHANICS OF MATERIALS.—RECITATIONS. The principles of stress and strain; the behavior of materials under tension, compression and shearing; investigation and design of pipes, riveted joints, boilers and standpipes; strength and flexure of simple and cantilever beams. Report on the carrying capacity of a floor. Text-book—Merriman's *Mechanics of Materials*. LABORATORY. Study and use of testing machines. Commercial tension tests of iron and steel. Modulus of elasticity in tension and compression; and shear tests of iron, steel and wood. Second term, Junior year. Three periods per week.

628. MECHANICS OF MATERIALS.—RECITATIONS. Restrained and continuous beams; columns; shafts; reinforced concrete. Text-book—Merriman's *Mechanics of Materials*. LABORATORY. Transverse tests of cast iron and wood; modulus of elasticity of steel in bending; tests of wooden columns; torsion tests of iron and steel; calibration of testing machines. Third term, Junior year. Three periods per week.

631. ROADS AND PAVEMENTS.—RECITATIONS. Reconnaissance, location, construction and maintenance of town and country roads, city streets and pavements, together with the methods of street cleaning. Text-book—Baker's *Roads and Pavements*. LABORATORY. Standard tests of paving brick and road metal. Second term, Junior year. Two periods per week.

641. MASONRY.—The requisites of stone, brick and cement; the different kinds of bonds; strength of stone, brick and concrete masonry; the construction of foundations, bridge

piers, abutments, retaining walls, dams, culverts and arches. Text-book—Baker's Masonry. First term, Senior year. Two periods per week.

642. MASONRY DESIGN.—Design of a dam, an arch and a culvert, using both graphical and numerical processes. Notes. Second term, Senior year. Two periods per week.

651. CEMENT.—RECITATIONS. The study of raw materials; method of manufacture; meaning and interpretation of different physical tests; the sources of error in testing; the inspection and sampling of both Portland and Natural Cements. Visits to cement mills and sampling and testing of a shipment of cement. LABORATORY. Tests of Portland and Natural cements are made in accordance with standard methods and specifications, the aim being to have the student become thoroughly acquainted with each standard test and understand and appreciate the significance of the results obtained. Special tests are made to show the effect of varying from standard methods. Text-book—Taylor's Practical Cement Testing. Laboratory Notes. First Term, Junior year. Two periods per week.

652. CONCRETE.—RECITATIONS. Materials for concrete; proportioning and mixing; strength of plain concrete in compression, tension and flexure; the expansion and contraction of concrete; fire resistance of concrete; action of salt water on concrete; concrete as a protection to metal; adhesion of concrete to steel and iron; a short discussion of the different systems of reinforcing. LABORATORY. The following work is required in the Concrete Laboratory: mechanical analyses of the materials for concrete; proportioning and mixing; making and testing of concrete specimens under compression and transverse loads. Second term, Junior year. Two periods per week.

661. HYDRAULICS.—RECITATIONS. Hydrostatics, hydraulic instruments, orifices, weirs and tubes. Text-book—Merriman's Hydraulics. LABORATORY. Tests are made on the circular orifice, the Venturi meter, water meters and weirs. Third term, Junior year. Two periods per week.

662. HYDRAULICS.—RECITATIONS. Pipes; conduits; rivers; water

power; dynamics; overshot, undershot and breast wheels; impulse wheels; turbines. Text-book—Merriman's Hydraulics. LABORATORY. Tests are made on the impulse wheel and the turbine. FIELD PRACTICE. Measurements of the flow of the Lehigh River in accordance with the methods used by the United States Geological Survey. Notes. First term, Senior year. Three periods per week.

663. HYDRAULICS.—RECITATIONS. Hydrostatics; orifices; weirs; tubes; pipes; conduits; rivers; waterpower; dynamics; overshot, undershot and breast wheels; impulse wheels; turbines. LABORATORY. Tests are made on the circular orifice, the Venturi meter, water meters, weirs, the impulse wheel and the turbine. First term, Senior year. Five periods per week.
671. SEWERAGE.—The disposal of sewage and garbage. The determination of the size and capacity of sewers, inlets and flush tanks. Construction methods. Text-book—Folwell's Sewerage. Second term, Senior year. Two periods per week.
672. SEWERAGE DESIGN.—Design of a sewer system for a small city with map and profiles. Notes. Third term, Senior year. Two and one-half periods per week.
681. WATER SUPPLY.—The requisites for a good water; the available sources of supply; the construction of pumping plants, reservoirs and pipe lines; purification of water and its distribution to the public. Text-book—Turneaure and Russell's Public Water Supplies. Second term, Senior year. Three periods per week.
682. WATER SUPPLY DESIGN.—Design of a water supply system for a small city. Notes. Third term, Senior year. Two and one-half periods per week.
691. ROOFS AND BRIDGES.—The theory and computation of stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Railroad bridges under locomotive wheel, excess and equivalent loads. Stress sheets. Notes. First term, Senior year. Two periods per week.
692. ROOFS AND BRIDGES.—The theory and computation of stresses in continuous, partially continuous, draw and cantilever trusses. Notes. Second term, Senior year. Two periods per week.

693. ROOFS AND BRIDGES.—The theory and computation of stresses in suspension bridges and three-hinged arches. Notes. Third term, Senior year. Three periods per week.
694. ROOF DESIGN.—Complete computations and design drawing for a wooden roof truss with bill of material and cost sheet. Notes. First term, Senior year. Three periods per week.
695. BRIDGE DESIGN.—Complete computations and design drawing of a plate girder for railroad purposes, in accordance with standard specifications. Bill of materials, weights and estimate of cost. Notes. Second term, Senior year. Two periods per week.
696. BRIDGE DESIGN.—Complete computations and design drawing of a through pin-connected railroad bridge in accordance with standard specifications. Bill of material, weights and estimate of cost. Notes. Third term, Senior year. Three periods per week.
697. BRIDGE ERECTION.—Designing of false work. Erection of a full-weight pin-connected truss bridge. Third term, Senior year. Two days.
698. GRAPHIC STATICS.—Analysis of stresses by the force and equilibrium polygons. Application of the equilibrium polygon to the discussion of beams and girders. Analysis of stresses in roof and bridge trusses. Notes. First term, Senior year. One period per week.
699. THESIS.—A thesis is required of every student as a condition of graduation, upon a subject appropriate to and approved by the Department. All laboratories and other apparatus belonging to the Department may be used for thesis purposes. Third term, Senior year. Two periods per week.

MINING ENGINEERING.

Professor Hall and Messrs. Marquard and Colliton.

701. MINE SURVEYING.—Instruments. Location of stations. Underground traversing. Different methods of connecting surface and underground surveys. Mapping. Corrections for top and side telescopes. Surveys of mineral lands and claims.

Calculation of ore in sight. Problems in mine surveying. First term, Junior year. Three periods per week.

711. PROSPECTING.—Physical character of deposits. Geological indications. Prospecting for placer vein and bedded deposits. Preliminary workings. Sampling. Examination and valuation of mining properties. Location of claims and application for patents. Placer and hydraulic mining. Second term, Junior year. One period per week.
712. DEEP BORING.—Uses and location of bore holes. Rod percussion drilling. American system of rope drilling. Diamond drilling. Special methods; Davis Calyx drill, Mather and Platt's system, Kind's system, hydraulic boring, etc. Survey of bore holes. Shaft sinking by boring. Second term, Junior year. One period per week.
713. BLASTING AND QUARRYING.—Explosives. Tools for boring blast holes, particularly machine rock drills. Determination of size of blast hole and amount of charge. Location of bore holes. Firing, especially by electricity. Slate quarrying. Quarrying of building material. Open mine workings. Third term, Junior year. Two periods per week.
714. SHAFT SINKING, DRIFTING AND TUNNELING.—Excavations. Support of excavations by timber, metal, cement and masonry. Mode of approach and location of opening. Sinking through strata of different kinds. Gangway driving. Special sinking methods; piling, drums, freezing process, Triger's method, Kind-Chandron system, Lippman's system. First term, Senior year. Two periods per week.
715. EXPLOITATION.—Different systems of coal and metal mining on the surface and underground. Mining machinery. Comparison of methods of development. First term, Senior year. Two periods per week.
716. TRANSPORTATION.—Underground haulage; motors, road-bed, and cars. Rope haulage. Self-acting planes. Surface haulage. Hoisting; motors, ropes, brakes, drums, guides, cages and attachments. Safety appliances. Head frames. Loading and unloading. Signaling. Stocking and storing of ores. Second term, Senior year. Two periods per week.

- 717. VENTILATION AND LIGHTING.**—Atmosphere of mines. Testing the air. Explosions. Natural ventilation. Furnace ventilation. Mechanical ventilation. Instruments for measuring the resistance of airways. Mine fires. Laws. Lighting; different methods. Safety lamps. Electric lighting. Laws. Second term, Senior year. Two periods per week.
- 718. MINE DRAINAGE.**—Mine pumps. Water column pipes. Dumps. Dams. Hoisting water. Drainage tunnels. Siphons. Erection and care of pumping machinery. Third term, Senior year. Three periods per week.
- 719. MINE CONSTRUCTION.**—Graphical and analytical methods for finding stresses. Building materials. Mining structures. Foundations, trestles, head-frames, bridge and roof trusses, ore-bins, tipples, etc. First term, Senior year. Three periods per week.
- 720. ORE DRESSING.**—Principles involved. Rock crushers, rolls and stamps. Ore feeders. Classifying machinery. Concentrating machinery; jigs, briddles, tubs, tables and vanners. Magnetic concentration. Amalgamation. Concentrating mills. Third term, Senior year. Four periods per week.
- 721. ELECTIVE IN MINING.**—Problems in mining. Designs for and Reviews of special mining operations. First term, Senior year. Two periods per week.
- 722. ELECTIVE IN MINING.**—Second term, Senior year. Two periods per week.
- 731. ELECTRICITY APPLIED TO MINING.**—Electricity and magnetism. Electrical measurements. Dynamos. Motors. Alternating current machinery. Transformers. Installation and operation of dynamo-electric machinery. Transmission of power by direct and alternating current. Meters. Switchboards. Problems. Second term, Senior year. Two periods per week.
- 732. ELECTRIC MINE MACHINERY.**—Wiring mines. Lighting workings. Electric signaling. Electric coal cutters, locomotives, drills, hoists and pumps. Electric blast firing. Electric machinery compared with machinery operated by compressed air and steam. Problems. Third term, Senior year. Two periods per week.

741. MINE ADMINISTRATION.—Mine accounts and book-keeping. Organization and management. Employment of labor. Third term, Senior year. Two periods per week.
751. MINING LAW.—Mining laws of the United States. Contracts. Examination and reports. Accidents. Second term, Senior year. Two periods per week.
761. THESIS.—A graduation thesis is required of each student who completes the course. This must be an original design or review of some process, machinery or plant related to mining operations. The subject of the thesis is assigned by the department and the thesis must demonstrate the ability of the student to pursue his chosen profession.

ELECTRICAL ENGINEERING.

Professors Moore and Dickinson.

801. ELEMENTS OF ELECTRICAL ENGINEERING.—Ohm's law; laws of resistance; Joule's law; electrolysis; magnetic principles; hysteresis; electrical measuring instruments; storage-cells. Text-book—Barr's "Principles of Direct Current Electrical Engineering." First term, Junior year. Three periods per week.
802. ELEMENTS OF ELECTRICAL ENGINEERING.—A continuation of 801. Electric lighting; electric controlling devices; switches; fuses; circuit breakers; elements of dynamo electric machinery. Second term, Junior year. Two periods per week.
803. ELEMENTS OF ELECTRICAL ENGINEERING.—A course devoted to a study of methods of electrical testing, designed to run parallel to laboratory course, 833. Text-book—Swenson and Frankenfield's Testing of Electromagnetic Machinery. Third term, Junior year. Two periods per week.
811. DYNAMO-ELECTRIC MACHINERY.—The text-book used in this subject is Thompson's Dynamo Electric Machinery. The text is followed closely. The subject is begun in the third term of the Junior year, occupying two periods per week, and is carried through the first term of the Senior year, occupying six periods per week during that term.

The student takes up carefully the theoretical and practical details concerning direct-current dynamos, motors and motor-generators.

Special attention is given to the subject of dynamo design, each student being required to design and draw a complete machine. During the first term of the Senior year, inspection trips to near-by electric stations are begun. A working knowledge of the subject is insisted upon, in order that the future engineer may at all times possess a complete mastery of this important branch of his profession.

821. ALTERNATING CURRENTS.—This subject is taken up by the aid of text-books, supplemented by lectures by the instructor. An analytical treatment is insisted upon, but only in so far as such treatment adds to an intimate and precise knowledge of the subject. Graphical methods are studied with a view to fixing firmly the principles of the subject.

The fundamental propositions dealing with alternating electromotive forces and currents are followed by a consideration of the subject of power in single and polyphase systems, its measurement, transmission, and sub-division. Text-books—Stills' Alternating Currents; Thompson's Dynamo Electric Machinery, Vol. 2. Second term, Senior year. Six periods per week.

822. ALTERNATING CURRENT MACHINERY.—The theory of transformers; alternating current dynamos; induction motors; synchronous motors; rotary converters; commutator motors. Text-book—Thompson's Dynamo Electric Machinery, Vol. 2. Third term, Senior year. Six periods per week.

831. ELECTRICAL LABORATORY.—Measurements of resistance; the Wheatstone bridge; Carey-Foster method; temperature coefficient; Murray and Varley loop; insulation test by voltmeter; tests upon insulation of wires; armature resistance by drop method; low resistance measurements. First term, Junior year. Two periods per week.

832. ELECTRICAL LABORATORY.—Comparison of electromotive forces; voltmeter and ammeter calibration; the potentiometer; magnetic qualities of iron and steel; the ballistic galvanometer;

comparison of capacities; measurement of self-induction and mutual induction. Second term, Junior year. Two periods per week.

833. ELECTRICAL LABORATORY.—Tests upon arc and incandescent lamps, magnetization and characteristic curves of dynamos, tests of armature reactions, parallel running of generators, study of wattmeters and watt-hour meters. Third term, Junior year. Two periods per week.
834. ELECTRICAL LABORATORY.—Investigation of commutator losses; heating of dynamos; compound dynamos; shunt, series and compound motors; motor-starters and rheostats; efficiency by stray power method; test of dynamos by Hopkinson's method. First term, Senior year. Two periods per week.
835. ELECTRICAL LABORATORY.—Elementary tests with alternating currents; effect of inductance and capacity; wave form; magnetization and characteristic curves of alternating current dynamos; efficiency and regulation tests of transformers; tests of induction motors and synchronous motors. Second term, Senior year. Two periods per week.
836. ELECTRICAL LABORATORY.—Advanced work in Alternating Current Testing; dielectric strength of insulating material; resonance; the oscillograph. A portion of the assigned time is given to thesis work. Third term, Senior year. Two periods per week.
841. ELECTRIC POWER TRANSMISSION.—The subject is begun by a study of direct current two-wire systems. This is followed by a consideration of three-wire systems, and special systems of distribution.

The subject of alternating current transmission is then taken up, using as a text, Hutchinson's Long Distance Electric Power Transmission. A mathematical study of the characteristic of long transmission lines completes the course.

The aim has been to emphasize the commercial features of the systems studied. Second term, Senior year. Three periods per year.

842. ELECTRIC POWER STATIONS.—A study of the considerations

affecting the selection, erection, and maintenance of steam and electric machinery, and the assembling of such machinery to form an economical plant for the production of electric power and light. Text-book—Koester's "Steam Electric Power Plants." Second term, Senior year. Two periods per week.

843. ELECTRIC RAILROADS.—Systems of distribution; rail-bonds and bond testing; electrolysis; direct current motors and controllers; single phase commutator motors; train operation and control; speed-time curves. Text-book—Wilson and Lydall's Electric Traction. Third term, Senior year. Three periods per week.

851. THE TELEPHONE.—This course consists in a study of telephone systems, using Miller's American Telephone Practice as a text-book. Modern common battery systems are the principal subject of a study, although the earlier systems are taken up in detail.

Automatic systems receive some attention, especially with reference to their possible use in manufacturing plants. Third term, Senior year. Two periods per week.

861. THESIS.—A thesis is required of every student as a condition for graduation, upon some topic assigned or approved by the instructor in charge. Third term, Senior year. Two periods per week.

CHEMISTRY AND METALLURGY.

Professors Hart and Wysor and Messrs. DeLong and Hess.

- 901.—ELEMENTARY DESCRIPTIVE INORGANIC CHEMISTRY. Brief course. Third term, Sophomore year. Two periods per week.
- 902-3-4.—QUALITATIVE ANALYSIS AND QUANTITATIVE ANALYSIS begun. First, second and third terms, Junior year. Two periods per week.
- 905-6-7.—QUANTITATIVE ANALYSIS. First, second and third terms, Senior year. Two periods per week.
- 911.—DESCRIPTIVE INORGANIC CHEMISTRY. Lectures, quizzes and laboratory work. First term, Freshman year. Four periods per week.
- 912.—DESCRIPTIVE INORGANIC CHEMISTRY. Continuation of Course

911. Organic Chemistry begun. Second term, Freshman year. Two periods per week.
- 913.—DESCRIPTIVE ORGANIC CHEMISTRY. Third term, Freshman year. Two periods per week.
- 914.—QUALITATIVE ANALYSIS. First term, Sophomore year. Two periods per week.
- 915.—QUALITATIVE ANALYSIS. Second term, Sophomore year. Two periods per week.
- 916.—QUALITATIVE ANALYSIS. Third term, Sophomore year. Two periods per week.
921. DESCRIPTIVE CHEMISTRY reviewed and QUALITATIVE ANALYSIS begun. First term, Sophomore year. Four periods per week.
- 922.—QUALITATIVE ANALYSIS. Continuation of Course 921. Second term, Sophomore year. Seven periods per week.
- 923.—QUALITATIVE ANALYSIS. Third term, Sophomore year. Six periods per week.
- 924.—ADVANCED ORGANIC CHEMISTRY including preparation work. Third term, Sophomore year. Two periods per week.
- 925.—QUANTITATIVE ANALYSIS continued. First term, Junior year. Two periods per week.
- 926.—THEORETICAL CHEMISTRY including special determinations in laboratory. First term, Junior year. Two periods per week.
- 927.—ADVANCED ORGANIC CHEMISTRY continued. First term, Junior year. Two periods per week.
- 928.—QUANTITATIVE ANALYSIS continued. Second term, Junior year. Two periods per week.
- 929.—THEORETICAL CHEMISTRY continued. Second term, Junior year. Two periods per week.
- 930.—ADVANCED ORGANIC CHEMISTRY continued. Second term, Junior year. Two periods per week.
- 931.—QUANTITATIVE ANALYSIS continued. Third term, Junior year. Eight periods per week.
- 932.—THEORETICAL CHEMISTRY continued. Third term, Junior year. Two periods per week.
- 933.—QUANTITATIVE ANALYSIS continued. First term, Senior year. Ten periods per week.
- 934.—CHEMICAL TECHNOLOGY. Manufacture of "heavy chemicals." First term, Senior year. Two periods per week.

- 935.—CHEMICAL TECHNOLOGY continued. Second term, Senior year. Two periods per week.
- 941.—CHEMICAL ARITHMETIC. Third term, Sophomore year. Three periods per week.
- 951.—METALLURGY.—Properties of Metals. Refractory materials and fluxes; furnaces; fuels and thermo measurements; ore dressing; iron and steel. First term, Junior year. Two periods per week.
- 952.—METALLURGY. Lectures, recitation and laboratory. Second term, Junior year. Two periods per week.
- 953.—METALLURGICAL CHEMISTRY. Elective. First term, Senior year. Two periods per week.
- 954.—METALLURGICAL CHEMISTRY (Continued). Elective. Second term, Senior year. Two periods per week.
- 955.—ASSAYING. Second term, Senior year. Two periods per week.
- 961-2-3.—TECHNICAL GERMAN.—Translation of Chemical works from the German. First, second and third terms, Junior year. One period per week.
- 964-5-6.—TECHNICAL GERMAN (Continued). First, second and third terms, Senior year. One period per week.
- 971.—THESIS WORK. Second term, Senior year. Six periods per week.
- 972.—THESIS WORK completed. Third term, Senior year. Fourteen periods per week.

GENERAL INFORMATION.

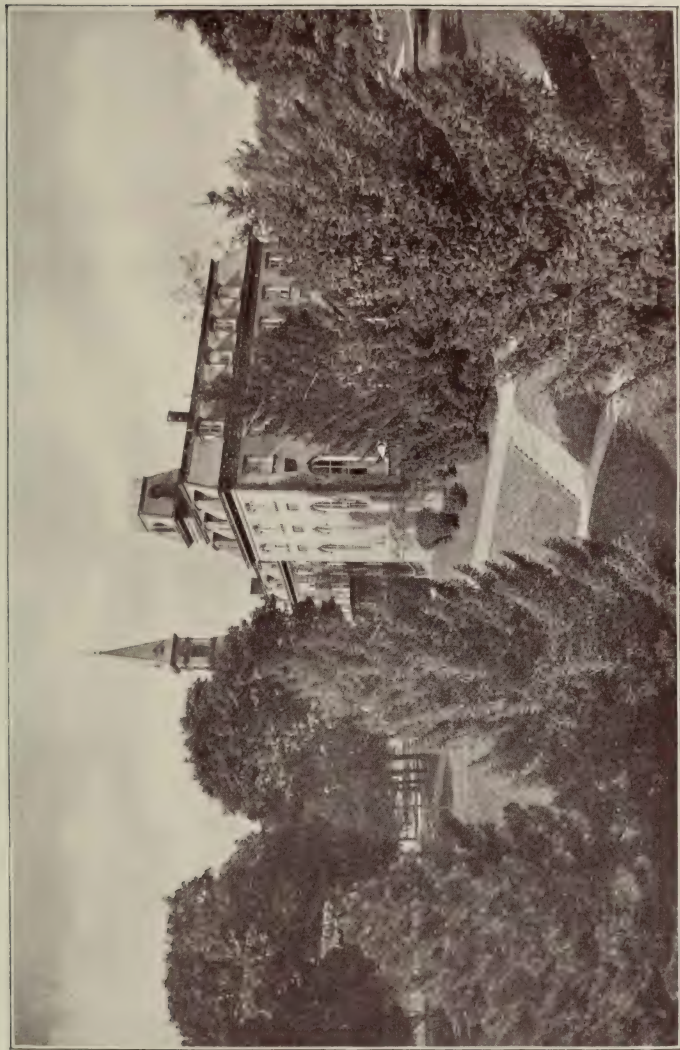
ATTENDANCE.

Attendance on all college exercises is strictly required. Absences on account of sickness, or for other satisfactory cause, may be excused, and leave of absence will be granted at the request of parents when absolutely necessary. In such cases the absence is excused, but the student is invariably required to make up such work as he may lose by reason of his absence. Reports are sent to parents whenever the absences of their sons exceed a reasonable number. In cases of the absences becoming excessive, the faculty will punish the neglect with suspension. Absences incurred at the beginning and end of terms, especially if they involve absence from examinations, and immediately preceding and succeeding holidays, are regarded with special disapproval and under ordinary circumstances will not be excused.

Each student is expected to have sixteen recitations each week. Three hours of field or laboratory work are regarded as equivalent to one recitation period. The regular gymnasium drills are also regarded as required exercises as far as prescribed. No student is permitted to take a course involving fewer hours of recitation without a special vote of the Faculty.

EXAMINATIONS.

Examinations are held at the close of each term on the studies of that term, and may be either written or oral, or both, at the option of the professor in charge. In addition to these regular examinations, partial ex-



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aminations and written recitations are held from time to time during the term, with or without notice to the students. Failure to attend an examination, except for reasons of absolute necessity, is regarded as a serious delinquency, and will be dealt with according to the circumstances of each case.

STANDING.

The scholarship of students is determined by the results of the examinations and daily recitations combined.

Students entering with conditions are required to make them up before the end of the term next after that in which they enter.

Students failing to pass in any studies of any term are required to make up such studies before the end of the next term, and they may be specially directed to do so at an earlier date. Students who do not comply with these regulations will be put on probation in scholarship, or lose standing and be only "permitted to recite," or be dropped into the next lower class, as the Faculty may, in each case, decide.

Reports of the standing of the students are made to their parents or guardians at the end of each term.

RULES GOVERNING ABSENCES AND RE-EXAMINATIONS.

1. No absence from a recitation, a lecture, or a laboratory exercise shall be excused.

2. If the number of a student's absences in any term from the exercises in any subject exceeds the number of exercises per week in the subject, but not double the number, he may, at the discretion of the instructor in charge, be debarred from the term examination in the subject, provided the number of absences is not less than three.

If he is debarred, he must pass on the subject before the first day of the next term or repeat the subject with a following class.

3. If the number of a student's absences in any term from any subject exceeds double the number of exercises per week in the subject, he must repeat the subject with a following class, provided that the number of such absences must exceed three.

4. If, for special reasons, the head of the department recommends it, the faculty may vote that a student who would otherwise be required to repeat a subject by Rule 3 be given one examination on the subject. If he fails in this examination, he must repeat the subject.

5. Before a student may take the examination provided for in Rule 4, he shall be required to pay to the treasurer of the college a fee of two dollars and show the treasurer's receipt for the same to the teacher in charge of the examination.

6. The instructor in charge of each subject shall, at the beginning of each week, post in some place easily accessible to the students interested, the number of absences from the exercises of the subject of each student to date.

7. All absences shall be reported weekly to the clerk of the faculty, who shall record them.

8. When the number of a student's unexcused and unpermitted absences from the religious and other exercises of the college reaches five, he shall be warned by his class dean; when it reaches ten, he shall be again warned; when it reaches fifteen, he and his parents shall be warned that he is in danger of being dropped from the college rolls; when it reaches twenty, he shall be dropped.

PERMITTED ABSENCES.

9. In case of absence due to prolonged sickness or request from home for urgent reasons approved by the class dean, the student shall, as soon after the absence as possible, present to his dean a written statement of the cause of his absence, after which the dean shall give the student an exact statement of the duration of his absence, which he shall present to his instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then take it to the clerk of the faculty, and the absences indorsed upon it shall not be counted by the clerk in making up the number of Rule 8.

When such permitted absence causes the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done by the class during as many of these absences as are required to bring his absences below the debarring number by an examination to be held within a month of the absences.

If he fail in this examination, he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before this special examination may be held, the student shall pay to the treasurer of the college a fee of two dollars, and shall show his receipt for the same to the instructor in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

10. When permission to be absent from town has been given to a student by vote of the faculty or by the president acting for the faculty, such student shall receive from the clerk of the faculty an exact statement of the duration of such absence, which he shall present to his instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then return it to the clerk of the faculty and the absences indorsed upon it shall not be counted by the clerk in making up the numbers of Rule 8.

When such permitted absences shall cause the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done during as many of these absences as are necessary to bring his absences below the debarring number by an examination held within a month of the absence.

If he fail in this examination he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before this special examination may be held, the student shall pay to the treasurer of the college a fee of two dollars and shall show his receipt for the same to the instructor in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

11. If professors, in whose departments a student has the majority of his hours per week, report to the faculty that the student is neglecting his work, he and his parents shall be warned that he is in danger of being dropped from the college rolls. If a second such report be made, he shall be dropped.

RE-EXAMINATIONS.

1. A student who fails at the regular term examination, in any subject, shall be entitled to one re-examination.

2. If, for special reasons, the head of the department recommend it, the faculty may vote that a student who has failed in the re-examination provided for in Rule 1 may be given a second re-examination.

3. Before a student can take the second re-examination provided for in Rule 2, he shall be required to pay to the treasurer of the college a fee of two dollars and show the treasurer's receipt for the same to the instructor in charge of the examination.

4. If, at the beginning of the college year, a student has failed to pass on his conditions of the preceding year in the departments of Mathematics, Mechanics, Physics, French and German—he shall be required to repeat the subjects in which he is still conditioned.

5. When subjects, which closely depend upon each other, are continued through successive terms, the department interested may require that all conditions of any term in those subjects shall be made up within two weeks from the beginning of the next term, in order that the student may go on with those subjects.

GRADUATION.

Students who have pursued the entire course as prescribed and have successfully passed their examinations

are recommended to the trustees for the first academic degree in course. Such recommendations are ordinarily acted upon and the degrees are conferred at Commencement, at which time the students receive diplomas from the President of the College. At Commencement the faculty awards such honors as it sees fit to those who are to receive degrees. These honors ordinarily consist of a valedictory oration, a Latin salutatory, and other honorary orations and theses.

COMMENCEMENT.

The College year is so arranged as to provide a term of 14 weeks immediately before the Wednesday preceding Christmas day and two terms of 11 weeks each after the Christmas vacation, the vacation at Christmas and in the Spring being two weeks each. The annual Commencement usually falls on the third Wednesday in June but occasionally the fourth Wednesday. In the years 1909 and 1910, Commencement will fall on the fourth Wednesday. The three days immediately preceding Commencement day are set apart for special exercises. On Sunday, the first of these days, a Baccalaureate sermon is preached in the College chapel at eleven o'clock in the morning; and in the evening a sermon is preached in the auditorium of Pardee Hall before the Brainerd Society of the College by some distinguished minister selected by the society.

The preacher for 1908 was Rev. Henry E. Jackson, '93, of Upper Montclair, N. J.

On Monday the Senior class holds its Class Day exercises on the campus.

The alumni and literary societies hold their reunions

on Tuesday, and orations are delivered before the literary societies in the Society halls.

The regular Commencement exercises are held in the auditorium of Pardee Hall on Wednesday morning, the afternoon being occupied by the alumni dinner. All these exercises are open to the public. Various other exercises of an athletic or social nature are conducted on the part of the students under a general supervision by the faculty.

DEGREES.

THE FIRST DEGREE.—The degree of *Bachelor of Arts* is conferred on the graduates of the Classical Course; *Bachelor of Philosophy*, on those of the Latin Scientific Course; *Bachelor of Science*, on those of the General Scientific Course; *Bachelor of Science* (in Chemistry), on those of the Chemical Course; *Civil Engineer*, on those of the Civil Engineering Course; *Engineer of Mines*, on those of the Mining Engineering Course; *Electrical Engineer*, on those of the Electrical Engineering Course.

MASTER'S DEGREE.

MASTER OF ARTS.—The degree of *Master of Arts* may be conferred one year after graduation on any *Bachelor of Arts* who has pursued a prescribed course of study, equivalent to sixteen recitations per week, during one year in residence, passed the examinations, and presented a satisfactory thesis.

The same degree may be conferred two years after graduation on any *Bachelor of Arts* who shall have devoted at least one year exclusively to advanced study under the direction of the faculty, passed examinations in the studies pursued, and presented a satisfactory thesis.

Candidates for this degree must in all cases register on or before October 1st, and examinations must be held at the college at least once in each college term. Theses must be presented for approval not later than May 1st. A registration fee of \$5 and tuition fee of \$100 per annum for residents, and \$45 per annum for non-residents, is exacted of all graduate students.

MASTER OF SCIENCE.--The degree of *Master of Science* may be conferred upon any graduate of the scientific department upon conditions similar to those prescribed for the degree of Master of Arts.

DOCTOR OF PHILOSOPHY AND OF LETTERS.

The degree of *Doctor of Philosophy* may be conferred three years after graduation on any college graduate who, during three years of continuous residence at the college, shall have devoted himself exclusively to advanced studies under the direction of the faculty, passed examinations in them, and presented a satisfactory thesis. The candidate must designate three branches of study which he desires to pursue, each in a different department, one major or principal study, and two minor studies. The faculty will recommend for this degree men of high capacity and attainments only. Length of residence or time spent in study constitute no claim for its bestowal.

The regulations governing registration, examination, theses, and fees are the same as for the Master's degree.

Any graduate of a recognized college may be permitted to pursue graduate studies under the direction of the professors in the various departments upon satisfactory evidence of his fitness to do so. No curriculum is prescribed for such students. A course of study is usually arranged after consultation which will meet the specific object each student has in view.

CERTIFICATES.

Students who have been admitted to any department of the college, and have passed satisfactory examinations therein, may obtain certificates of the work which they have done if they have been in attendance not less than one year.

RELIGIOUS INSTRUCTION.

The aim of Lafayette College is distinctly religious. Under the general direction of the Synod of Pennsylvania of the Presbyterian Church its instruction is in

full sympathy with the doctrines of that body. At the same time religious instruction is carried on with a view to a broad and general development of Christian manhood within the lines of general acceptance among evangelical Christians, the points of agreement, rather than those of disagreement, being dwelt upon.

Prayers are held each morning in the chapel at 7:50 and religious services in the chapel Sunday mornings at 11 o'clock. All students are expected to attend these services. No exceptions will be made to this rule for morning prayers. Where there is some exceptional reason assigned by the parents, students will be permitted to attend one of the churches in Easton instead of the Sunday morning service. This permission will be granted only on request of parents and for sufficient reason.

Special sermons are preached before the college from time to time by distinguished ministers. The preachers for 1908 were: Rev. James Ramsey Swain, Philadelphia; Rev. Joseph W. Cochran, D.D., Philadelphia; Rev. H. M. Mellen, Newark, N. J.; Rev. John F. Carson, D.D., Brooklyn, N. Y.; Rev. Rollin A. Sawyer, Harrisburg, Pa.; Rev. J. Gray Bolton, D.D., '72, Philadelphia; Rev. Alexander J. Kerr, D.D., Wilkes-Barre, Pa.; Rev. William P. Swartz, Ph.D., Poughkeepsie, N. Y.; Rev. Edward F. Reimer, '97, Princeton, N. J.; Rev. Robert Christie, D.D., Allegheny, Pa.; Rev. W. T. L. Kieffer, D.D., Milton, Pa.; Rev. John E. Lloyd, D.D., Brooklyn, N. Y.; members of the faculty and the local clergy.

The preacher for the Day of Prayer for Colleges, 1909, is Rev. John Timothy Stone, D.D., Brown Memorial Church, Baltimore, Md.

Instruction in the Bible has always held a prominent part in the College, and a full account of the courses in Bible study will be found on pages 81-82.

LECTURES.

Special courses of lectures are given annually in connection with several departments and will be found under those departments. A more general course of a popular character is given each year.

Among those who delivered lectures during the year 1908 are: Mr. C. H. Easton; Prof. Rudolph Leonhard, Leipsic, Germany; Dr. Joseph W. Cochran, Philadelphia, Pa.; Hon. R. T. W. Duke, Jr., Charlottesville, Va.; Prof. W. B. Owen, Easton, Pa.

TERMS AND VACATIONS.

The College year is divided into three terms, with intervening vacations, as given in the Calendar on page 3. All the classes are examined at the close of each term, and a report sent to the parent or guardian. Students are required to be present punctually at the beginning of each term, and are not allowed during term-time to be absent from town, except by written permission from the President.

The Wednesday after the 20th of October in each year is observed as Founders' Day, in memory of those who founded the College and of those who have since contributed to its usefulness. On Founders' Day, 1908, an address was delivered by Prof. William P. Mason, LL.D., of Rensselaer Polytechnic Institute.

BUILDINGS, LABORATORIES, LIBRARIES.

The college grounds are situated upon the summit of a beautiful hill, overlooking the city of Easton. They are reached by a flight of stone steps, which ascend the bold front of the hill directly from the head of Third Street, or by electric cars, which skirt the face of the hill by a gradual incline. At the head of the steps stands the monument erected by the alumni association to their comrades who "died for the Union." The grounds contain about forty acres terraced and laid out under the direction of Donald G. Mitchell. The buildings upon the campus are thirty in number. The oldest of these is

SOUTH COLLEGE.

The central portion of this structure is the original college building, erected in 1833. It contains several lecture-rooms and a number of dormitory rooms. Two wings were added to the original building, which contain the College chapel and lecture-rooms for the English, Latin, and Greek Departments.

THE VAN WICKLE MEMORIAL LIBRARY.

The Van Wickle Library was dedicated on May 30, 1900. It has given to the College one of the most needed additions to its equipment. A beautiful building of Pompeian brick and terra cotta, thoroughly furnished with the most approved appliances for library work, it is at once a most beautiful and useful feature in the college's development. It contains a large reading room, in which the periodicals and books of most constant reference are to be found; a reference book department;

a large room for the general storage of the library; librarian's room; and small rooms for special work.

PARDEE HALL.

The most commanding position on the campus is occupied by this building, the most conspicuous evidence of the liberality of the late Ario Pardee, which reached to every department of the college. Here the departments of civil, mining, and electrical engineering are supplied with thoroughly equipped laboratories, and lecture-rooms, and the museums of these departments, and of general geology, mineralogy, and natural history, are to be found. The Ward Library and the handsome rooms of the two literary societies are also in this building, and the central portion of the second and third floors of the main building contains a beautiful auditorium, in which the Commencement exercises, lectures, and other public entertainments are held.

JENKS BIOLOGICAL HALL.

This building was erected in 1864-'65 by the late Barton H. Jenks, of Philadelphia. It was recently entirely remodeled.

THE GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY,

completed in 1902, is occupied by the departments of chemistry and metallurgy. The building consists of three stories, and is constructed of Indiana stone, colonial brick, and gray terra cotta. It is fireproof, with steel and cement floors, and gives a thoroughly modern equipment to these departments. This building con-

tains also the Henry W. Oliver Chemical and Metallurgical Library.

THE ASTRONOMICAL OBSERVATORY,

in addition to the Observatory proper, contains a lecture-room, with accommodations for the students in astronomy.

WEST COLLEGE

contains the lecture-room of Dr. Francis A. March and the offices of the registrar and treasurer of the College.

GYMNASIUM.

The importance of physical culture was early recognized by this College and a gymnasium was erected in 1884 and placed under the direction of a competent instructor. At the present time regular drills are required of the Freshman and Sophomore classes four times a week. Optional training in general gymnastics and fencing offered to upperclassmen, and the students are encouraged to participate in such outdoor sports as their physical developments fits them for.

The gymnasium is equipped with all the apparatus requisite to physical training, with lockers, bath and dressing rooms. Before taking part in the gymnasium exercises, or the outdoor sports every student is given a thorough examination, and great care is taken to give each student such exercises as he needs and to avoid anything that would be injurious. In addition to the Director, one of the most able and experienced physicians of Easton acts as consulting physician, and requests for special work or exception from any prescribed work are

passed on by the Director and the Consulting Physician. No excuses from the required drills will be granted except upon the recommendation of these officials. A fine athletic field adjoins the campus. It is admirably equipped for athletic contests. Four recent classes erected a commodious field house on it. Here the contests in football, baseball, and track athletics, in which the students have excelled, are held.

No student may take part in any public contest without written permission from his parents previously filed with the Clerk of the Faculty.

THE DORMITORIES.

A complete reorganization of the dormitory system was effected in the summer of 1900 by the building of central structures, known as Knox and Fayerweather Halls, to connect Blair and Newkirk Halls and Martien and Powell Halls respectively, and the facing of the completed buildings with mottled Pompeian brick, handsomely trimmed with red terra cotta. The architectural beauty of the buildings is in marked contrast with the former appearance of the separate buildings. These halls are connected with McKeen Hall in a common steam plant. A complete sanitary plumbing system of baths, sinks, closets, and electric lights has been installed in all the buildings. These improvements leave nothing to be desired for the health and comfort of the students.

INFIRMARY.

A building on the extreme northeast corner of the campus, facing upon McCartney Street, is set apart for the use of sick students, thus securing quiet and com-

plete isolation in case of the occurrence of any contagious disease.

This building is intended solely for the use of students rooming in the College buildings.

BRAINERD HALL.

This building for the Y. M. C. A., the gift of J. Renwick Hogg, Esq., '78, of the Board of Trustees, was erected in 1902. It is a three-story gray stone building in the Tudor Gothic style. It contains a large room for the meetings of the society, and reading, writing, and committee rooms; also a trophy room for the athletic association, a room for the collection of curios from foreign missionary fields, and bowling-alleys in the basement.

Its object is to afford a home under active Christian influences for all forms of student life.

OTHER BUILDINGS.

The remaining buildings consist of a large GREENHOUSE, a useful adjunct to the department of botany, and also supplying flowers and plants for the adornment of the grounds in summer and of the buildings on public occasions. Besides these, a number of buildings are occupied as the HOMES OF THE MEMBERS OF THE FACULTY. The intimate relations resulting from the residence of both faculty and students upon the College grounds are regarded as one of the most wholesome features of the College life.

LIBRARIES AND READING-ROOM.

The main regular College Library occupies the Van Wickle Memorial Library, described above. The College Library was established at the foundation of the College, and has had a steady and uninterrupted growth

since 1832, and is chiefly made up of books bearing directly on the courses of instruction. The Ward Library, the gift of the heirs of C. L. Ward, Esq., of Towanda, is largely made up of books of general literature and history and Political Science. Each of the technical departments has also a collection of books, magazines, and other scientific publications in rooms in immediate connection with their lecture-rooms and laboratories. By the gift of \$5,000 Mr. Henry W. Oliver laid the foundation of the H. W. Oliver Chemical Library in the new Gayley Laboratory. The foundation has been added to by gifts from Prof. Edward Hart and others, and the incorporation of the College's collection of chemical works.

A friend of the College has bought and presented to the Henry W. Oliver Chemical and Metallurgical Library all the pamphlets, about three thousand in number, belonging to the library of the late Prof. Johannes Wislicenus, of the University of Leipsic.

The literary societies, also, have libraries numbering about 6,000 volumes, largely of a literary character, which valuably supplement the more solid libraries of the College.

The College Library contains a papyrus scroll, five feet long, from a mummy at Thebes, with a hieratic inscription—pronounced by Seyffarth the finest he has seen—presented by the late Hon. John W. Garrett, of Baltimore, of the class of '37, and a collection of prints and medals of General Lafayette presented by the late President William C. Cattell, D.D., LL.D.

There is also a full-length portrait of Lafayette, by

Healey, presented by the late Dr. Thomas W. Evans, of Paris.

ALUMNI ALCOVE.—A collection of books and pamphlets written by the students, alumni, faculty and trustees of the College is being gathered and set apart as a "Lafayette Library" to represent the literary activities of the College. This unique and valuable collection now numbers about 400 volumes, and includes a full set of the College catalogues from 1832 to the present time, the Commencement addresses, and official publications of the College.

The **LIBRARIES** have received gifts, which are hereby gratefully acknowledged, from the following individuals and institutions:

Individuals:

Frank Allaban (2); Edwin A. Barber (1 vol., 3 pamphlets); Rev. S. G. Barnes (2); Hon. J. Davis Broadhead (10); Prof. S. J. Coffin; Dr. J. Ackerman Coles (20); Prof. L. P. Dickinson (2); Rev. Seth R. Downie; James Elliott; Estate of Wm. Ziegler; Dr. B. Rush Field (2); A. C. Gaebelein; J. I. D. Hinds; Rev. Henry E. Jackson; John W. Jordan; M. B. Lambert; Dr. Frederic R. Marvin; John B. Peaslee; Prof. J. M. Porter (9); Prof. J. F. L. Raschen; George L. Raymond; Prof. Allan Roberts (4); Edwin J. Sellers; Hervey W. Shimer (1 pamphlet); Wm. Henry Smith (2); Frank P. Steami (5); Prof. J. Burkitt Webb (17); I. C. Williams; Prof. F. N. Willson.

Firms and Institutions:

American Philosophical Society (6); Canada Geological Survey (2 vols., 4 pamphlets); Canada Dept. of Mines (5 pamphlets); Carnegie Foundation for the Advancement of Teaching; Carnegie Institute; Georgie State Geologist (2); Harvard University, Jefferson Physical Laboratory (2); Isthmian Canal Commission; Michigan State Board of Health; National Prison Association (14); New Jersey State Geological Survey (2); New Jersey State Library (2);

Peace Association of Friends of Philadelphia; Pennsylvania Society of the Sons of the Revolution; Pennsylvania State Library (7); Philadelphia Bureau of Surveys (2); Vivisection Reform Society of Chicago (1 vol., 2 pamphlets).

United States Government Bureaus and Departments, viz.:

Bureau of Equipment, Navy Department; Civil Service Commission; Commissioner of Education; Treasury Department, Bureau of Public Health and Marine Hospital Service (17).

The Class of 1871 has given to the College a fund, the proceeds of which are to be used for the purchase of the publications of the Early English Text Society. The library now contains a large and valuable collection of these.

The class of 1875 at its reunion in 1905 by the gift of one thousand dollars established an alcove in the library to be known as "The Francis A. March Alcove."

The class of 1892 at its decennial reunion in 1902 established an alcove in the library devoted to American literature. Two hundred volumes have been purchased and additions will be made from time to time.

SCIENTIFIC COLLECTIONS.

These are extensive and valuable, and are rapidly increasing from year to year by gifts from societies and individual donors, and by special appropriations in addition to the fees for registration and matriculation.

Among the most valuable of the collections may be mentioned the extensive herbarium, collected by Prof. Thomas C. Porter during forty years of enthusiastic labor; it is especially rich in North America plants and is believed to contain the most complete flora of Pennsylvania in existence and the series of Ward's celebrated casts, illustrating geology and palaeontology.

The apparatus in the department of physics and applied mechanics, the instruments used in the departments of astronomy and engineering, and the scientific equipment of the numerous and extensive laboratories, meet the demands of advanced instruction in these departments; a special feature, however, is the series of nine hundred wall charts, executed at the College by Gustave Garnier, under the direction of the professors in the departments

of astronomy, chemistry, physics and applied mechanics, metallurgy, and natural history. There are valuable models in machine drawing, stone cutting, crystallography, and architecture.

COLLEGE SOCIETIES.

LITERARY SOCIETIES.

The *Washington* and *Franklin* societies were organized early in the history of the College and are conducted by the undergraduates. Both societies have well-furnished apartments in Pardee Hall, and valuable libraries. They meet every Wednesday evening for literary exercises, consisting of orations, essays, and debates. A generous rivalry for College honors exists between them, and each year representatives of the two societies from the Junior class engage in a public contest in oratory. On the day before Commencement the societies hold reunion meetings in their halls. These societies are an important part of College life and work, and *all the students are strongly advised to join them.*

BRAINERD EVANGELICAL SOCIETY.

The *Brainerd Evangelical Society*, as a society of inquiry, meets each Thursday evening and on the first Friday of each month in the interest of missions, and for the promotion of Christian effort. Its public anniversary is held on Sabbath evening of Commencement week, at which time a sermon is preached usually by some former members of the Society. In 1908 the preacher was Rev. Henry E. Jackson, '93, of Montclair, N. J.

BIOLOGICAL SOCIETY.

The *Biological Society* is for the purpose of making its members intelligent concerning the important bio-

logical questions of the day, enabling them to appreciate the value of research in nature. The membership consists of those students of the three upper classes who are either prospective or present members of the classes in biology, and of such graduate students as are interested in the laws of life comprehended through the natural history sciences.

CHEMICAL CLUB.

The *Chemical Club* meets every Thursday at seven o'clock, P.M., for reading and discussing papers contained in the current chemical magazines, and to listen to lectures from visiting chemists. During 1908 the club listened to lectures from Dr. William McMurtrie, New York, N. Y.; Dr. C. E. Munroe, Washington, D. C.; Mr. E. B. Cook, Pottstown, Pa.

DEUTSCHER VEREIN.

This Society is organized to promote interest in the German language and literature. Meetings are held fortnightly. Lectures on German life and culture are given at each meeting

EXPENSES.

The tuition is \$100 per annum in all departments. Sons of ministers of the Presbyterian Church and candidates for its ministry receive free tuition in the Classical Course, and are charged one-half tuition in the technical courses.

The other College charges are as follows:

General expenses.....	\$8.00 a term
Library and Reading-room.....	5.00 "
Gymnasium.....	2.00 "

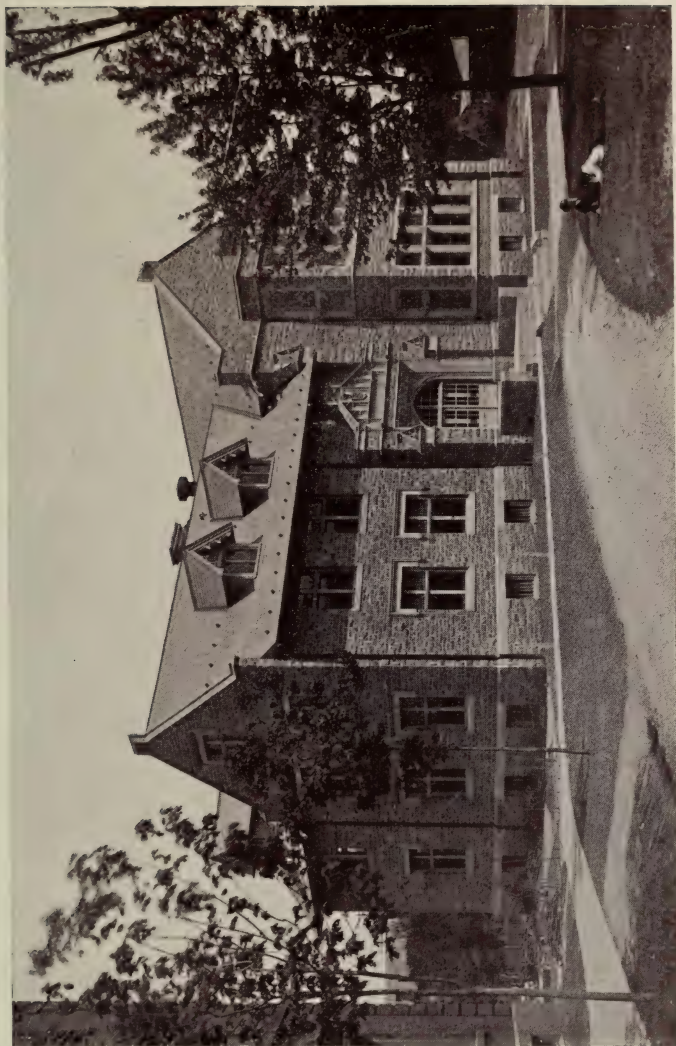
The annual College charges are, therefore, for those who pay tuition in full, \$145.

Entrance Fees.—Each student pays \$5 when he is registered for examination on entering College, and \$10 when he is matriculated, thirty days afterwards. These fees are appropriated in part to the Library Fund and to the increase of the scientific collections and apparatus. No fees are charged for diplomas.

Laboratories.—Apparatus for the use of students in the chemical laboratories will be furnished and charged in their account, and the charge canceled for that returned in good condition. Chemicals and all other materials will be charged according to the average cost. A deposit sufficient to meet these expenses is made on entering the laboratories. Members of the classical department are admitted to all the privileges of the laboratories while studying general chemistry, and, for the present, without charge for the aid of the professor in attendance; each student will, however, pay for chemicals which he uses, and for any apparatus which he may break or injure. In the physical laboratory a fixed charge of \$5 per term is made for supplies and the use of apparatus.

Scholarships.—The endowed scholarships providing free tuition in the Classical Course will hold good for the Latin Scientific Course, but students in the other courses of the Pardee Scientific Department are required to pay one-half of the regular tuition fee in addition to the scholarship.

Aid is also given to young men of ability and good moral character who are dependent on their own efforts for their education. The amount will depend on the



BRAINERD HALL.

necessities of the applicant, but in no case will exceed the amount of the tuition fees in the Classical and Latin Scientific Courses, or one-half the tuition fees in the other technical courses. Application for such aid should be made to the President. No aid is granted to students pursuing special or incomplete courses of study.

BOARD, ROOMS, WASHING.

In all cases the place of boarding must be approved by the Faculty. The price of table board in clubs managed by the students at present averages from \$3.75 to \$4.00 per week. Board, including furnished room, in private families, is from \$4.50 to \$6 per week. Washing costs 40 cents per dozen pieces.

Unfurnished rooms in the College buildings rent for \$5 to \$30 a term (average \$15.88); unfurnished rooms adjacent to the College premises for \$12 to \$16 a term, or furnished rooms for \$15 to \$30 a term.

Students are expected to room in the College dormitories unless they receive permission to room elsewhere. If they do not occupy College rooms, they are subject to an assessment to meet the loss to the College for rooms left vacant. The reason for this rule is that the funds of the College have been invested in the dormitories in order to secure cheap and convenient lodgings for the students, and it is to the advantage of all that the buildings should be occupied, the income from the investment being essential to the work of the College, and the students being protected against exorbitant rents.

Information in regard to the selection of rooms can be had from Professor Moore, inspector of College buildings, the buildings being open for inspection during

each term, and three days preceding the first day of each term. Rooms are assigned only to students who have been admitted to College, or who present full certificates from authorized schools, in the order of their application.

The rules of the Board of Trustees require that all College bills shall be paid in advance. For the convenience of the students it is arranged that payments of the bills shall be made by the Seniors on the first Thursday of each term, by the Juniors on the first Friday, by the Sophomores on the first Saturday, and by the Freshmen on the first Monday. No student is regarded as regularly enrolled for any term until his bill is paid. He may be dropped from the roll for neglect of his bill at any time upon notice from the treasurer to the faculty.

Students entering after the middle of the term shall pay one-half of the College charges for the term. Students obliged, on account of sickness, to leave before the middle of the term may have refunded to them one-half of the College charges for the term; no reduction will be made to those leaving for any other cause.

Where it is impossible for a student to pay his bill on the day it is due, the Executive Committee has power to extend the payment of the bill for not more than thirty days, provided that a written request is filed with the treasurer *on the day the bill is due*, stating a satisfactory reason for the extension. A penalty of 10 per cent. will be added to every bill remaining unpaid after the expiration of thirty days, and no student whose bill is unpaid shall be permitted to take the term examinations. Those desiring the bill to be sent home, must

call at the treasurer's office during the first week of the term, acquaint themselves with the items of the bill, make the request that it be sent and give the address to which it is to be sent.

The care and regulation of the dormitories are under the direction and management of a Board of House Representatives, elected by the students. House rules are enacted and enforced by the board. The Parietal Committee, composed of the inspector of buildings and officers of inspection who reside in the dormitories, acts as a court of appeal.

Fuel Deposit.—The treasurer also, on behalf of the committee of students, collects with the College bills \$6 at the beginning of the first and second terms for fuel. The unexpended balance, if any, is refunded by the committee at the close of the year. Of late, the average cost for heating has been \$12.68 for each student in the steam-heated dormitories, and \$8.61 in the buildings heated by warm-air furnaces or stoves. The steam-heated dormitories are also lighted by electricity, the cost of which to each of the occupants is about \$6 a year.

A deposit of \$1 is also made at the beginning of each term to pay for public damages, the unexpended balance of which is returned to the student at the end of the year.

Annual Expenses.—Some money for books and other incidental expenses will be needed, but, with close economy, the total annual expenses—exclusive of tuition, clothing, and traveling expenses—need not exceed \$282, as will be seen from the following summary:

	Liberal.	Moderate.	Minimum.
General college expenses.....	\$24 00	\$24 00	\$24 00
Charge for College reading-rooms, gymnasiums, etc.....	21 00	21 00	21 00
Board, 36 weeks, at \$3.75 to \$4.50.	160 00	144 00	135 00
Rent of College-room, \$15 to \$90..	90 00	36 00	15 00
Light and fuel.....	18 00	15 00	12 00
Washing.....	25 00	16 00	9 00
Tuition.....	100 00	100 00	100 00
Books and stationery.....	38 00	21 00	16 00
	\$476 00	\$377 00	\$332 00
Deduct for sons of ministers, <i>et al.</i> , in Classical Course.....			100 00
			\$232 00
Deduct for same in other courses..			\$50 00
			\$282 00
Lowest charges for nec- } Classical.. essary expenses..... } Technical ..			\$232 00
			282 00

Laboratory fees and damage assessment, which vary in amount, must also be added, while the personal expenses for clothing, etc., must be estimated according to individual experience. The first year will be made more expensive by the fees for registration and matriculation, and furnishings for room; \$300 will therefore be a small allowance.

Parents and guardians at a distance may deposit funds with some member of the faculty, who will pay particular attention to the pecuniary concerns of the student, settling his bills, and transmitting an account of the expenditure, for which services he will charge a commission. It is strongly recommended that par-

ents furnish their sons with little beyond what will meet their necessary expenses.

BEQUESTS AND DEVISES.

Each state has special statutory regulations in regard to wills, and it is most important that all testamentary papers be signed, witnessed, and executed in all other respects according to the laws of the state in which the testator resides. In all cases, however, the name of the corporation must be accurately given, as in the following forms:

I give, devise, and bequeath to "Lafayette College," in Easton, Pennsylvania, their successors and assigns forever, the sum ofdollars, to be invested by said corporation in good real estate security, and the interest accruing therefrom to be applied to the support of the Professors in said College.

I give, devise, and bequeath a certain lot situated, etc., to "Lafayette College," in Easton, Pennsylvania, and to their successors and assigns forever, for the uses and purposes of said College, according to the provisions of its charter.

PRIZES.

The following prizes are offered annually:

THE FRANCIS A. MARCH PRIZE IN ENGLISH.

A prize of thirty dollars in books was given from 1862 to 1881 by the late Rev. William C. Fowler, LL.D., of Durham, Connecticut, and since 1881 has been continued by Henry A. Potter, M.S., class of '77, of New York, under the title of "The Francis A. March Prize," upon the following conditions:

"A committee of at least three shall be chosen by the faculty to determine which student of the Senior class has made the greatest proficiency in English philology.

"The decision of the committee is to be made after attending an examination in some English classic, conducted by the professor in English, and after reading essays written by the several

members of the class, which shall contain a discussion of the language of some English classic."

The subject in 1909 will be the works of Ben Jonson.

THE ASTRONOMICAL PRIZE.

A prize of thirty dollars in gold is awarded to the student making the greatest progress in the study of astronomy in the Senior year.

MATHEMATICAL PRIZES.

Two prizes of the value of twenty dollars each are offered in the department of mathematics to those students of the Junior class, one in the Classical and general courses of the scientific department, and one in the technical departments, who shall have exhibited during the first two years of the course the greatest proficiency in the study of mathematics.

These prizes were founded, as was the astronomical prize above mentioned, in 1867, by Professor Traill Green, M.D., LL.D.

THE LOUNSBURY PRIZE IN CHAUCER.

A prize, consisting of books, is given to that student of the Sophomore class who shall present the best essay upon some one of the works of Chaucer. This prize was given in 1896 by Thomas R. Lounsbury, professor of English at Yale University, and will be continued by friends of the College as the Lounsbury prize in Chaucer.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE.

A prize, consisting of books of the Early English Text Society, of London, is given to that student of the Sophomore class who shall at the close of the Sophomore year pass the best examination in "English before Chaucer." The examination is based upon selected texts announced from year to year, which in 1909 will be from the New Testament.

This prize was founded in 1871.

THE CLASS OF '83 PRIZE.

A prize of the value of fifteen dollars is annually awarded to that member of the Sophomore class who shall have attained the highest standing in his division of the class in Trench on The Study of Words.

This prize was founded by the class of 1883 at their graduation.

COLEMAN BIBLICAL PRIZES.

Three prizes, each of the value of twenty dollars, are awarded to those students of the Freshman class who have attained the highest standing in the several divisions of Biblical study in that year.

These prizes were founded by the Rev. Lyman Coleman, D.D., in 1880.

PRIZES IN ORATORY.

The Washington and Franklin literary societies appropriate one hundred dollars a year for prizes in oratory. Four contestants are chosen from each Hall to take part in the Junior Oratorical Contest, which is held in May. In the presence of a public audience three judges, approved by the faculty, hear the speakers and award the prizes. Their decision is based on the merits of the performances as to originality and force, with reference both to composition and delivery. The first prize is fifty dollars, the second prize thirty dollars, and the third prize twenty dollars.

PRIZES IN DEBATE.

Three prizes, of the total value of fifty dollars, are awarded to the successful competitors in a Senior contest in debate, held on Washington's birthday in each year, between three contestants from each of the literary societies, chosen by a competitive debate in each society prior to December 1st in the previous year. The amount of the prizes and the conditions of the award are similar to the Junior Oratorical Contest. The first of these contests was held in 1894. The subject for debate in 1909 is:

RESOLVED, "*That the Republican Party should carry out the pledge of 'Tariff Revision' by sweeping reductions in all schedules affecting the poor man's food and dress, and the profits of so-called Trusts.*"

CIVIL ENGINEERING PRIZE.

A prize of the value of fifty dollars, the gift of Carroll Phillips Bassett, C.E., Ph.D., of the class of 1883, is annually awarded to that member of the graduating class who presents the best graduating thesis and attains the highest standard of scholarship in the Civil Engineering Course.

THE PARK PRIZE IN LATIN.

A prize of fifteen dollars for the Latin Department has recently been founded by Mr. Samuel R. Park, A.M., '84. In 1909 it will be awarded, on the work of the second and third terms Freshman class for excellence in Horace.

HISTORICAL ESSAY PRIZE.

A prize consisting of a copy of his work, "*The Marquis de Lafayette in the American Revolution*," is given annually by Charlemagne Tower, Jr., LL.D., of Philadelphia, to that member of the Senior Class who shall, on or before the first day of October, present the best essay on some subject connected with the relations of *France and the United States*. The essays must not exceed three thousand words in length. The subject for the year 1909 is: "*The Value of the French Alliance in the American Revolution*."

THE CHEMICAL ESSAY PRIZES.

A prize of five dollars in books is awarded each term to that member of the Junior or Senior class who shall present the best term theme on some chemical subject.

THE GILBERT PRIZE IN OLD ENGLISH.

By the will of Howard Worcester Gilbert, who died in Chester County, March 5, 1895, a bequest was left to the college, with the provision that a gold medal of the value of forty dollars should be awarded every two years to the student writing the best essay on the Old English Language and Literature, beginning with Beowulf, in the earliest Anglo-Saxon period, and extending down to the year 1070. Should the competitors be of equal merit, preference is to be given to residents of Pennsylvania.

The medal is an inch and three-fourths broad, three-sixteenths of an inch thick, and contains on its face a relief portrait of King Alfred, with the date 871-901, surmounted by the Anglo-Saxon phrase, "Naes he gold hwaete." The reverse shows a garland encircled with the legend, "Howard Worcester Gilbert Old English Prize. Founded 1895." Space is left for the name of the recipient.

This prize will be awarded at the Commencement of 1908. It is open to competition of students of Anglo-Saxon in the graduate

courses of 1907-'08 and 1909-'10. The essay must be handed in by May 1, 1909.

'85 PRIZE IN PHYSICS.

The class of 1885 founded a prize in 1897 in the sum of \$500, the annual income of which is given to that member of the Junior class who attains the highest rank in the studies of mechanics and physics.

THE BLOOMBERGH PRIZE.

The class of 1888 at its decennial reunion, subscribed the sum of \$500, the annual income of which is awarded to that member of the Junior Class who shall attain the greatest proficiency in the study of the French and German languages and their literatures.

THE B. F. BARGE GOLD MEDAL.

A prize of a gold medal of the value of \$100 was founded by Benjamin F. Barge, Esq., of Mauch Chunk, Pa., to be awarded to that member of the Senior class who shall deliver the best oration in an annual contest to be held on Memorial Day, May 30th. The contestants, not more than six in number, are to be chosen by a committee of the faculty from those members of the Senior class, who shall hand in orations on or before May 1st upon topics assigned by the committee not later than March 15th of each year.

BARGE MATHEMATICAL PRIZES.

By the bequest of the late Benjamin F. Barge, Esq., of Mauch Chunk, three prizes have been established for excellence in mathematical studies. These prizes will be awarded to members of the Sophomore class for excellence in the solution of original problems.

THE R. B. YOUNGMAN GREEK PRIZE.

The class of 1884, at its vigintennial reunion, subscribed the sum of \$500, the income of which is to be awarded to that member of the Sophomore class who shall attain the greatest proficiency in Greek.

THE NEW SHAKSPERE SOCIETY'S PRIZE.

A prize of books is awarded to that member of the Junior class who passes the best general examination upon Shakspeare, his works, life, character, etc.

RECENT ADDITIONS.

The Department of Mining Engineering and Graphics has received an exhibit of mine safety lamps and acetylene lamps from Freeman and Wolf, Zwickau, Germany; mine trolley hangers from J. Freund, '98, and H. M. Hirst, '08; mine blue prints from E. S. Tillinghast, '00; treatise in laboratory methods of grading and analyzing ores from F. H. Uhler, '06; photographs from Browning Engineering Co., Cleveland, Ohio; Mexican mine maps from Kennedy, '01.

The Department of Chemistry has received gifts from Dr. Wm. McMurtrie '71, L. C. Shank 1912, M. O. Cedarquist 1912, Harbison and Walker, Pittsburg, Pa., Edward B. Cook, Pottstown, Pa., and C. E. Munroe, Washington, D. C.

The Department of Physics has received valuable additions from C. Willis Bixler & Co., Easton, Pa., W. B. Drinkhouse '08.

NOTE.—In all cases where a prize is awarded to an essay or oration the successful competitor must hand to the proper authority two typewritten copies of his production before receiving the prize, if he is requested to do so.

DEGREES CONFERRED.

HONORARY DEGREES.

June 17, 1908.

DOCTOR OF LAWS.—Prof. Howell Terry Pershing, M.D., of the Denver and Gross Medical College, University of Denver, Denver, Colo.

DOCTOR OF DIVINITY.—Rev. Henry T. Beatty, '89, pastor First Presbyterian Church, Hoboken, N. J.

MASTER OF SCIENCE.—Richard Kidder Meade, '99, Nazareth, Pa.

October 21, 1908.

DOCTOR OF LAWS.—Prof. William Pitt Mason, professor of Chemistry, Rensselaer Polytechnic Institute, Troy, N. Y.

DOCTOR OF DIVINITY.—Rev. George Steelman Holmes, pastor Methodist Episcopal Church, Irwin, Pa.

MASTER OF ARTS.—John Keats Stewart, '98, professor of Greek, State Normal School, Shippensburg, Pa.

DEGREES IN COURSE.

June 17, 1908.

BACHELOR OF ARTS.—C. L. Albert, Pa.; H. B. Bartolet, Pa.; H. L. Buckley, Pa.; W. H. Davidson, N. J.; W. G. Davis, Pa.;

J. W. R. Engle, Pa.; D. R. Evans, Pa.; W. J. Fetter, Pa.; L. A. Gates, N. Y.; C. E. Gilmore, Pa.; D. M. Kirkpatrick, Pa.; H. T. Long, Pa.; C. P. Maxwell, Pa.; W. I. Miller, Pa.; F. P. O'Brien, Pa.; C. J. Ruch, Pa.; H. K. Sangree, Pa.; J. H. Smith, Pa.; L. R. Turner, Pa.; R. S. Whitesell, Pa.; J. F. Williams, Ohio; S. D. Wylie, Pa. Total, 22.

BACHELOR OF PHILOSOPHY.—D. B. Armstrong, Pa.; F. A. Brotzman, Pa.; W. B. Drinkhouse, Pa.; D. L. Hartstine, Pa.; A. S. Hutchison, N. J.; N. Jacobs, Pa.; P. H. Kleinhans, Pa.; R. L. Logan, Pa.; C. D. Long, Pa.; C. S. McHenry, Pa.; A. W. Sullivan, Ill.; F. W. Sullivan, Ill.; J. H. West, Pa. Total, 13.

BACHELOR OF SCIENCE.—C. A. Hensey, D. C.; L. W. Myers, N. J.; Total, 2.

CIVIL ENGINEER.—C. E. Albert, Pa.; B. M. Ayerigg, N. Y.; W. N. Boyer, Pa.; R. S. Bristol, N. Y.; M. B. Buckley, Mass.; E. Doremus, N. J.; C. J. Folk, N. J.; R. L. Gebhart, Pa.; S. M. Haight, N. Y.; H. G. Lee, N. J.; R. A. McCachran, Pa.; W. J. MacAvoy, Pa.; H. Maue, Pa.; A. C. Morgenstern, Pa.; H. C. Mutchler, Pa.; C. N. Reading, Jr., N. J.; H. A. Schmidt, N. Y.; A. B. Shimer, Pa.; R. L. Smith, Pa.; O. S. Styer, N. J.; E. H. Uhler, Pa.; Total, 21.

ELECTRICAL ENGINEER.—J. W. Giles, N. J.; G. A. Koerber, Pa.; E. S. LaBar, Pa.; W. G. Peters, Pa.; E. B. Severs, Pa.; S. H. Sherrerd, Pa.; E. W. Wade, N. J.; H. T. Wootton, N. J. Total, 8.

MINING ENGINEER.—J. W. Caswell, Pa.; G. O. Deshler, Pa.; E. L. Flad, Pa.; J. Freund, Pa.; W. A. Hauck, Pa.; H. M. Hirst, Pa.; F. M. Howard, Pa.; T. L. Howard, Pa.; H. D. Kinney, Pa.; A. S. Pollock, Pa.; R. L. Porter, Pa.; J. W. Colliton, '06, Pa. Total, 12.

BACHELOR OF SCIENCE IN CHEMISTRY.—T. E. Arnold, Pa.; L. C. Chandler, Pa.; C. R. Ellicott, Pa.; H. Green, Pa.; W. L. Jackson, N. Y.; E. C. Sandt, Pa.; J. K. Satchell, Pa.; G. N. Shaeffer, N. Y.; C. H. Williston, N. J. Total, 9.

MASTER OF ARTS.—E. F. Farquhar, Pa.; C. F. Pfatteicher, Pa. Total, 2.

Total—First Degree, 89.

COMMENCEMENT DISTINCTION, 1908.

HONORS.—Leo Alvin Gates, Hornell, N. Y. (Latin Salutatory); Howard Benjamin Bartolet, Lehighton; Roie Smith Bristol, Lima,

N. Y.; Floyd Ambrose Brotzman, Easton; Nathaniel Jacobs, Plymouth; Thomas Lawrence Howard, Duquesne; George Albert Koerber, Hazleton; Louis Charles Chandler, Scranton; Clinton Joseph Ruch, Hellertown (Valedictory).

ORATIONS.—John W. Caswell, Lime Hill; George Oliver Deshler, Bangor; Elias Doremus, Gladstone, N. J.; Raymond Lewis Gebhardt, Easton; David Reese Evans, Plymouth; Henry Green, Easton; Harry George Lee, East Orange, N. J.; Harry Maue, Hazleton; Wilson Isaac Miller, Easton; Samuel Hawley Sherrerd, Easton; John Forest Williams, Martins Ferry, Ohio.

PRIZES AWARDED.

SENIOR PRIZEMEN.

THE FRANCIS A. MARCH PHILOLOGICAL PRIZE: Clinton J. Ruch, Hellertown.

THE ASTRONOMICAL PRIZE: Roie S. Britsol, Lima, N. Y.

THE BASSETT PRIZE IN CIVIL ENGINEERING: First prize, divided equally between Raymond L. Gebhardt, Easton, and Aaron B. Shimer, Easton. Second prize, divided equally between Charles N. Reading, Jr., Frenchtown, N. J., and Elias Doremus, Gladstone, N. J.

THE MEDICO-CHI SCHOLARSHIP PRIZE: Walter E. Kiefer, '07, Easton.

THE AMERICAN INSTITUTE OF CIVICS PRIZE: Clinton J. Ruch, Hellertown.

THE CHEMICAL ESSAY PRIZES: Carl F. Schoen, Scranton.

SENIOR DEBATE.

QUESTION: *Resolved, That the Interstate Commerce Commission has exercised powers not conferred on the national government, and injurious to the business interests of the country.*

SPEAKERS.

Washington Hall.

Franklin Hall.

David R. Evans, *affirmative*.

Clinton J. Ruch, *negative*.

Louis Chandler, *negative*.

Leo A. Gates, *affirmative*.

Arthur W. Sullivan, *affirmative*.

Frank O'Brien, *negative*.

FIRST PRIZE: Clinton J. Ruch, Hellertown, Pa.

SECOND PRIZE: Leo A. Gates, Hornell, N. Y.

THIRD PRIZE: Frank P. O'Brien, Scranton, Pa.

B. F. BARGE GOLD MEDAL PRIZE: Clinton J. Ruch, Hellertown.

JUNIOR ORATORICAL PRIZES.

Franklin Hall.

Samuel J. Mills.
 William E. Brown.
 Irvin J. Schafer.
 David R. Edwards.

Washington Hall.

Harold R. Chidsey.
 Howard J. Bell.
 Marvin C. Carter.
 Bertram W. Simpson.

FIRST PRIZE: Bertram W. Simpson, Chicago, Ill.

SECOND PRIZE: Harold R. Chidsey, Easton.

THIRD PRIZE: Samuel J. Mills, Chefoo, China.

THE CLASS OF '85 PRIZE IN PHYSICS: David R. Edwards, Chatham, N. J.

THE BLOOMBERGH PRIZE IN MODERN LANGUAGES: Samuel J. Mills, Chefoo, China.

JUNIOR PRIZEMAN.

THE SHAKESPEARE PRIZE: John Nightingale, Easton.

SOPHOMORE PRIZEMEN.

THE CLASS OF '83 PRIZE IN ENGLISH: John H. Dalrymple, West Orange, N. J.; John F. A. Moore, Hornell, N. Y.

THE TRAILL GREEN PRIZE IN MATHEMATICS: George F. Aldrich, Easton; Henry W. Eckel, Washington, N. J.

THE B. F. BARGE MATHEMATICAL PRIZES:

FIRST: Warren J. Conrad, Reading.

SECOND: Henry R. Koehler, Hazleton.

THIRD: Stewart R. Race, Cornish, N. J.

THE LOUNSBURY PRIZE IN CHAUCER: Joseph H. Zerbey, Jr., Pottsville.

THE R. B. YOUNGMAN GREEK PRIZE: Philip A. Swartz, Poughkeepsie, N. Y.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE: Philip A. Swartz, Poughkeepsie, N. Y.

FRESHMAN PRIZEMEN.

THE LYMAN COLEMAN BIBLICAL PRIZES.

DIVISION A: Edward R. Barnard, Hamilton, Ontario.

DIVISION B: Raymond G. C. Jolly, Orangeville.

DIVISION C: George McCahon, Derry, Ireland.

DIVISION D: Charles B. Swartz, Poughkeepsie, N. Y.

THE PARK PRIZE IN LATIN: Charles B. Swartz, Poughkeepsie, N. Y.

CLASS MONITORS.

Appointed for general excellence in study:

SENIOR CLASS: D. E. Edwards.

JUNIOR CLASS: P. A. Swartz.

SOPHOMORE CLASS: C. B. Swartz.

FRESHMAN CLASS: H. L. Benson and F. B. Wildrick.

THESES PRESENTED BY CANDIDATES FOR
DEGREES IN THE TECHNICAL COURSES OF
THE PARDEE SCIENTIFIC DEPARTMENT.

June 17, 1908.

1. The Effect of Oil on the Compressive Strength of Concrete.
BENJAMIN MERNARD AYCRIGG, Walden, N. Y.
HENRY CLAY MUTCHLER, Easton.
2. The Effect of Freezing upon the Compressive Strength of
Cement Mortar.
CHARLES JAMES FOLK, Phillipsburg, N. J.
3. The Effect of Storage of Cement upon Its Physical Properties.
WILLIAM JAMES MACAVOY, Hazleton.
4. Holding Power of Railroad Spikes.
CHARLES NELSON READING, JR., Frenchtown, N. J.
ELIAS DOREMUS, Gladstone, N. J.
5. The Effect of Repeated Stress on Wooden Beams.
ARTHUR CLEMENS MORGENSTERN, Easton.
RUSSELL ATCHESON MCCACHRAN, Newville.
6. Modulus of Elasticity of Concrete in Compression.
ROIE SMITH BRISTOL, Lima, N. Y.
HARRY MAUE, Hazleton.
7. A Mine Drainage Tunnel.
ROBERT LIDDLE PORTER, Clearfield.
8. Preparation of Hydroquinone.
CHARLES ROY ELLICOTT, Easton.
9. Discussion and Analysis of Carnotite.
THOMAS ELLISON ARNOLD, Pen Argyl.
10. Investigation of Methods for the Preparation of Anilin.
CYRUS HAMLIN WILLISTON, Phillipsburg, N. J.
11. An Examination of Wulfenite.
HENRY GREEN, Easton.

12. The Genesis of Petroleum.
WILLIAM LEWIS JACKSON, Chester, N. Y.
13. The Synthetic Sugars from Formaldehyde.
LOUIS CHARLES CHANDLER, Scranton.
14. The Product of the Slow Oxidation of Graphitic Carbon.
GEORGE NASH SHAEFFER, Lockport, N. Y.
15. The Preparation and Distillation of Calcium Trichloracetate.
EARL CLIFFORD SANDT, Easton.
16. The Synthesis of Formic Acid by Unusual Methods.
JAMES KENNETH SATCHELL, Easton.
17. Test of a 5 Kw. Motor-Generator Set.
JOHN WILLIAM GILES, Phillipsburg, N. J.
GEORGE ALBERT KOERBER, Hazleton.
18. Study of Commutator Losses.
ELTINGE SILKMAN LABAR, Scranton.
WALTER GRAY PETERS, Bushkill.
19. Test of Rail Bonds.
ELMER BONNELL SEVERS, Philadelphia.
SAMUEL HAWLEY SHERRERD, Easton.
20. Review of Electric Power Station at South Easton.
ELLIS WHITFIELD WADE, Hackettstown.
HENRY TISSINGTON WOOTTON, Boonton, N. J.
21. The Bearing Value of Various Sizes of Bolts on Different Kinds of Wood.
OLIVER SMITH STYER, Burlington, N. J.
22. The Strength of Belting and Various Kinds of Fastenings.
MARTIN BURNS BUCKLEY, Boston, Mass.
23. Lost Head Due to Pipe Fittings.
RAYMOND LEWIS GEBHARDT, Easton.
AARON BOYER SHIMER, Easton.
24. Test of a Two-Three-Inch Centrifugal Pump.
CHARLES ELWOOD ALBERT, Pen Argyl.
EUGENE HENRY UHLER, Stockertown.
25. Test of a Four-Inch Venturi Water Meter.
HARRY GEORGE LEE, East Orange, N. J.
HALSEY DARIUS ROGERS, West Hampton Beach, N. Y.
26. Adhesion of Steel and Concrete.
SILAS MAXWELL HAIGHT, ELMIRA, N. Y.

27. The Effect of Clay upon the Absorptive Power and Compressive Strength of Concrete.
HENRY AUGUST SCHMIDT, Brooklyn, N. Y.
ROSCOE LEE SMITH, Berwick.
28. The Effect of Fineness of Cement upon Its Physical Properties.
WESLEY NATHANIEL BOYER, Weissport.
29. Design of an Electric Mine Hoist.
JOHN WHITNEY COLLITON, Easton.
30. The Pahaquarry Copper Company.
JOHN W. CASWELL, Lime Hill.
GEORGE OLIVER DESHLER, Danger.
HARRY DILL KINNEY, Easton.
31. Haulage at Law Shaft, Central Colliery, Arvea, Pa.
HARRY MORE HIRST, Lansdowne.
JULIUS FREUND, Honesdale.
32. Steel Manufacture at Clairtown, Pa.
WILLIAM ALONZO HAUCK, Easton.
33. Assaying at the Perth Amboy Plant of the American Smelting and Refining Co.
EARLE LEIGHTON FLAD, Easton.
34. Crushing and Separating Plant of the New Jersey Zinc Company at Franklin Furnace, N. J.
FRANK MICHAEL HOWARD, Duquesne.
35. The Rossie Hematite Mine at Spragueville, N. Y.
THOMAS LAWRENCE HOWARD, Duquesne.
36. Haulage at the Anna S. Mine at Antrim, Pa.
ANSON SAMUEL POLLOCK, Antrim.

THE ALUMNI ASSOCIATION.

The Alumni Association is composed of graduates of the College and such former students as left College before graduation, in good standing, as may be elected. The annual meeting is held on Tuesday, preceding Commencement Day.

The Association has the privilege of choosing, every alternate year, two members of the Board of Trustees, who hold office for six years. In June, 1908, Simon Cameron Long, '77, of Pitts-

burg, and John E. Fox, '85, of Harrisburg, were chosen. In the Spring of 1910 two more will be voted for.

The Executive Committee is as follows: McCluney Radcliffe, M.D., '77, Chairman, Philadelphia; Fred R. Drake, '86, Easton; Charles B. Green, '86, Easton; James W. Fox, '88, Easton; Burr McIntosh, '84, New York, N. Y.; Rush N. Harry, '89, New York, N. Y.; Casper Dull, '77, Harrisburg.

It is desirable to keep up the full record, so long maintained, of the residences, occupations, literary efforts, and public services of the alumni and former students of the college.

Information is solicited in regard to these points, and also in reference to matters appropriate to the obituary record, which is annually prepared for the alumni association.

Each alumnus is asked to send his personal record, carefully revised to date, to the secretary before May 1, 1909.

ALUMNI ASSOCIATION OF LAFAYETTE.

J. EDWARD DURHAM, '78, Philadelphia.....*President*
ROBERT F. WHITMER, '85, Philadelphia.....*Vice-President*
REV. J. F. STONECIPHER, D.D., '74, Easton...*Sec. and Treasurer*

LOCAL ASSOCIATIONS.

THE LAFAYETTE ALUMNI ASSOCIATION OF NORTH-EASTERN PENNSYLVANIA.

PROF. J. P. BREIDINGER, '82, Wilkes-Barre.....*President*
OSCAR J. HARVEY, '71, Wilkes-Barre.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF PHILADELPHIA AND VICINITY.

HARRY EMMONS, '76, Wilmington, Del*President*
CHARLES B. ADAMSON, 210 Chestnut Street, Phila.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF NEW YORK AND VICINITY.

WILLIAM E. BAKER, '77, New York.....*President*
JOSEPH O. SKINNER, '02, 84 William Street, New York..*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF THE WEST BRANCH.

FRED. H. PAYNE, '88, Williamsport.....*President*
R. FLEMING ALLEN, '90, Williamsport.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF CENTRAL PENNSYLVANIA.

REV. A. N. HAGERTY, '81, Carlisle.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF WESTERN PENNSYLVANIA.

EDWARD C. CHALFANT, '95, Pittsburg.....*President*

JOHN F. TIM, '01, 1205 Berger Bldg., Pittsburg.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF MARYLAND.

ROBERT H. SMITH, '67, 53 St. Paul Street, Baltimore..*President.*

PEARCE KINTZING, M.D., '81, Baltimore.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF CHICAGO AND VICINITY.

W. F. JOHNSON, '91, Chicago.....*President*

LAMBERT HENDLEMAN, '98, 94 Market Street, Chicago....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF THE NORTH-WEST.

REV. GEO. C. POLLOCK, D.D., '61, Litchfield, Minn.....*President*

HON. JAMES T. HALE, '77, Duluth, Minn.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF WASHINGTON, D. C.

JAMES F. R. APPLEBY, M.D., '64, Georgetown.....*President*

SNOWDEN ASHFORD, '88, 918 Farragut Square.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF NEW JERSEY.

WAYNE DUMONT, '92, Paterson, N. J.....*President.*

FREDERICK F. KENNEDY, '98, 774 Broad Street, Newark

N. J.....*Secretary.*

ASSOCIATION OF ST. LOUIS AND THE SOUTHWEST.

REV. C. L. CHALFANT, '89, St. Louis.....*President.*

H. P. G. COATES, '92, St. Louis.....*Secretary.*

JUNIOR ALUMNI ASSOCIATION OF EASTON.

C. F. OLDT, '00, Easton.....*President.*

H. B. MOON, '99.....*Secretary.*

STUDENTS.

GRADUATE STUDENTS.

S. B. Gillhuly, A.M., N. J.	History and English Literature,	Lafayette, '86.
J. B. Hench, A.M., Pa.	Latin,	Lafayette, '83.
Allan Roberts, Ph.B., M.S., Pa.	History and Political Science,	Lafayette, '99.
C. F. F. Garis, Ph.B., Pa.	Mathematics and German,	Lafayette, '03.
E. F. Farquhar, A.M., Pa.	English and Philology,	Lafayette, '05.
C. F. Pfatteicher, A.M., Pa.	Philosophy and English Literature,	Lafayette, '03.
W. M. Smith, Ph.B., Pa.	Mathematics and Astronomy,	Lafayette, '03.
J. W. Colliton, C.E., E.M. Pa.	Mining Engineering,	Lafayette, '06.
William H. Kirkpatrick, A.B., Pa.	History and Political Science,	Lafayette, '05.
Carmon Ross, Ph.B., Pa.	Modern Languages,	Lafayette, '05.
Rev. Scott R. Wagner, A.M., Pa.	Philosophy,	Franklin and Marshall, '97.
Glenn C. Heller, A.M., Pa.	Philosophy,	Franklin and Marshall, '98.
Lewis S. Trump, A.B.	Philosophy,	Muhlenberg, '00.
Cyrus H. Williston, B.S., N. J.	Chemistry and Biology,	Lafayette, '08.
William T. Foster, Ph.B., N. J.	Zoology, Botany and Geology,	Lafayette, '06.
Leo A. Gates, A.B., Pa.	Latin and English,	Lafayette, '08.

GRADUATES..... 16

SENIOR CLASS, 1909.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Otis Tiffany Barnes.....	C.....	Philadelphia.....	Δ K E.
Howard James Bell.....	C.....	Auburn, N. Y.....	φ Δ Θ.
Remsen Du Bois Bird.....	C.....	Rondout, N. Y.....	85 N.
William Eustis Brown.....	L.....	Boonton, N. J.....	68 B.
Marvin Clarence Carter.....	Ch.....	Scranton.....	102 McK.
Harold Russell Chidsey.....	C.....	Easton.....	Paxinos Ave.
William Warren Craig.....	L.....	New Germantown, N. J.	Y. M. C. A.
Frank Belin Davenport.....	C.E.....	Wilkes-Barre.....	138 F.
Harry Gardner DeWitt.....	C.E.....	Scranton.....	φ Δ Θ.
Lincoln Cook Dodge.....	C.E.....	Hazleton.....	88 N.
David Reed Edwards.....	C.....	Chatham, N. J.....	19 S.
Clarence Edward Fee.....	L.....	Bremen, Germany...	140 F.
Howard Walker Fields.....	C.E.....	Media.....	115 McK.
Nathaniel Rue Foster.....	C.....	Imlaystown.....	105 McK.
Frank Andrew Gehr.....	C.....	Greensburg.....	91 McK.
John Wagener Green.....	C.E.....	Easton.....	Pierce & McC.
William Henry Hartzell, Jr... C.....		Easton.....	R. F. D. 5.
Robert Harris Hutchison....	C.....	Malvern.....	68 B.
Richard Johanknecht.....	C.E.....	Rock Castle, Va.....	90 N.
Addison Leslie Jones.....	E.E.....	Easton.....	834 Northampton.
Robert Conrad Kay.....	G.S.....	Pittsburg.....	Δ K E.
Mahlon Bunting Knowles....	C.E.....	Yardley.....	140 F.
Walter John Kocher.....	C.E.....	Easton.....	Bushkill.
Thomas Ridgway Lathrope....	L.....	Carbondale.....	122 McK.
Frank Hill Lerch, Jr.....	Ch.....	Easton.....	Home.
William John McCandless....	C.....	Phila.....	—
Alvah Rufus McLaughlin....	L.....	Dunmore.....	63 B.
Albert Ralph McMeen†.....	L.....	Mifflin.....	φ Δ Θ.
Ellery Dolson Manley.....	L.....	Elmira, N. Y.....	Θ Δ X.
Charles Frederick Maxwell....	C.....	Greensburg.....	92 McK.
Clifton Pool Mayfield.....	C.E.....	Washington, D. C....	78 K.
Percy Ellwood Mebus.....	C.E.....	Easton.....	119 S. 9th.
George Franklin Metz.....	E.E.....	Hazleton.....	84 N.
Edward Archibald Mewhinney.	C.....	Easton.....	415 Valley.
Samuel John Mills.....	C.....	Chefoo, China.....	62 B.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Edward Corbin Moore.....	E.M....	Flushing, N. Y. . .	107 McK.
Harold Stephenson Newins....	L.....	Patchogue, N. Y. .	113 McK.
John Allen Nightingale.....	L.....	Easton. 338 Spring Garden	
Alvin Clyde Nolf.....	E.E....	Easton.....	241 Bushkill.
Joshua T. Paxson.....	C.E....	Dreshertown.....	65 B.
Howard Kent Preston.....	C.E....	Trenton, N. J.....	82 N.
Silas Swallow Riddle.....	C.E....	Bloomsburg.....	115 McK.
Elbert Ross.....	Ch.....	Bangor.....	84 N.
William Crosby Ross.....	C.....	Wilmington, Del.....	Brd.
Robert Amandus Sandt.....	E.E....	Easton.....	412 High.
Rollin Alger Sawyer, Jr.....	C.....	Harrisburg.....	φ Δ Θ.
Ralph Percy Schelly.....	Ch.....	Phillipsburg, N. J.,	
		80 S. Main.	
Adolph Philipp Schneider.....	E.E....	Honesdale.....	138 F.
Carl Frederick Schoen.....	Ch.....	Scranton.....	66 B.
Irvin Jonathan Shafer.....	C.....	Reading.....	25 S.
Bert William Simpson.....	C.....	Chicago, Ill.....	161 E.
John Paul Snyder.....	Ch.....	Easton.....	126 N. 10th.
Harry T. Spengler.....	C.E....	Easton.....	123 So. 7th St.
Miller Didama Steever.....	L.....	Washington, D. C..	Δ K E.
Edgar Mark Troutfelt.....	L.....	Scranton.....	66 B.
George Franklin Walter.....	C.E....	Easton.....	R. F. D. 2.
Robert Stanley Walter.....	C.....	Easton... 4th and Bushkill.	
Francis Benjamin Watkins....	E.M....	Washington, D. C.	148 P.
Frank Happersett Wells, Jr...L.....		Chester Springs..	105 McK.
Andrew Jackson Wight.....	C.....	Perth Amboy, N. J..	φ Δ Θ.
SENIORS.....			60

JUNIOR CLASS, 1910.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
George Frederick Alrich.....	E.E.....	Easton, Lachenour Heights	
Paul Mitchell Arndt.....	E.E.....	Phillipsburg, N. J.,	3 Chambers.
George Calvin Baker.....	L.....	Noxen.....	173 E.
Arthur Augustus Blaicher.....	E.M.....	Newark, N. J.....	78 K.
Robert Franklin Brown.....	C.....	Easton.....	R. F. D. 4.
John Cawley.....	G.S.....	Springtown.....	24 S.
John Boyer Cline.....	E.E.....	Stewartsville, N. J.	Home.
Warren John Conrad.....	C.....	Reading.....	46 S.
Isidor Coons.....	L.....	Wilkes-Barre	94 McK.
Joseph Force Crater, Jr.....	C.....	Easton.....	5th and Ferry.
Wilson Crawford.....	E.E.....	Summit Hill.....	71 B.
Springer Lawrence Cuning- ham, Jr.....	E.E.....	Pittsburg.....	139 F.
John Hart Dalrymple.....	C.....	West Orange, N. J.....	Brd.
Joseph Benson Darlington†....	Ch.....	West Chester.....	Δ K E.
William Walker Darsie†.....	E.M.....	Pittsburg.....	θ Δ X.
James Shackelford Dauerty....	C.....	Philadelphia.....	26 S.
Alvan Yost Deisroth.....	L.....	Hazleton.....	83 N.
Joseph Jay Durfee.....	C.E.....	Covington, N. Y.....	32 S.
William Thomas Edgell.....	E.E.....	Wilkes-Barre	33 S.
Henry M. Edwards, Jr.†.....	C.E.....	Scranton.....	Δ K E.
Ralph Lawrence Ely.....	C.....	Allegheny.....	147 P.
Milton Rutherford Evans.....	E.M.....	Plymouth.....	24 S.
Orville Crawford Fay.....	C.....	Hollidaysburg.....	127 M.
William Edgar Fielding.....	C.E.....	South Orange, N. J.	—
Reuben Frank Gies†.....	E.M.....	Easton.....	129 S. 3rd.
William Fogg Goodwin.....	E.E.....	Bridgeton, N. J.....	26 S.
Arthur Rand Gordon.....	E.M.....	West Hampton, N. Y.,	170 E.
Abram Packer Hays.....	L.....	Munhall.....	θ Δ X.
Daniel Ackerman Herrick.....	L.....	Kingston, N. Y.....	130 M.
William Blake Hindman.....	C.....	Chillicothe, O.....	θ Δ X.
Burton Hotchkiss.....	C.E.....	Washington, D. C.....	134 M.
George Webster Hunt.....	C.E.....	Riegelsville, N. J.....	Home.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Frank Elison Hutton.....	E.E....	Kingston, N. Y.....	73 K.
Frank Henry Irmschler.....	C.E....	Easton.....	114 McK.
Thomas Cowling Jeffery.....	C.....	Pen Argyl.....	116 McK.
Floyd Myron Johnson.....	C.E....	Covington.....	150 P.
Edward Hunting Jones.....	C.....	East Hampton, N. Y.,	131 M.
Albert Barnes Judson.....	Ch.....	Meshoppen.....	147 P.
Albert Felix Kahn.....	L.....	Easton.....	37 S. 6th.
Arthur Emanuel Keiber.....	C.....	Drums.....	64 B.
Frank Henry Kelly†.....	C.E....	Reedsville.....	φ Δ θ.
Henry Reuben Koehler.....	C.....	Hazleton.....	171 E.
Gideon Richie Kreider, Jr.†..	Ch.....	Annville.....	Δ K E.
William Stanley Lanterman†..	E.M....	Easton.....	231 Bushkill.
Davis Winans Lusk†.....	C.....	Newark, N. J.....	132 M.
George Shiffer McCaa.....	E.M....	Plains.....	133 M.
Frederick Collier McCutcheon..	C.....	Sharpsburg.....	θ Δ X.
Robert Eton McPherson.....	C.....	New Bloomfield.....	37 S.
Harry Wilmer Markle.....	L.....	Greensburg.....	92 McK.
Willard Charles Masonheimer..	C.....	Weatherly.....	83 N.
Raymond Stanley Metzgar....	E.E....	Phillipsburg, N. J.	71 Bennett.
Nathan Roy Miller†.....	L.....	Mauch Chunk....	100 McK.
Thomas Overfield Mitman.....	C.....	Hellertown.....	Home.
John Francis A. Moore.....	L.....	Hornell, N. Y.....	130 M.
Arthur Henry Myers.....	L.....	Somerville, N. J.....	169 E.
John Sanford Noble, Jr.....	L.....	Easton.....	226 Porter.
Joseph Oliver Parker.....	L.....	Pittsburg.....	θ Δ X.
Donald Rankin.....	Ch.....	Scranton.....	70 B.
David Weimer Rial.....	Ch.....	Greensburg.....	72 B.
Frank Weimer Royer.....	E.E....	Greensburg.....	φ Δ θ.
August Henry Schaaf†.....	C.E....	Baltimore, Md.....	148 P.
Joseph Albert Skeer†.....	C.....	Bloomsburg.....	Δ K E.
Guy Fuller Smith.....	E.M....	Camptown.....	35 S.
Louis Thurston Southwick....	C.E....	New York, N. Y....	Δ K E.
Clinton Emanuel Steinheiser..	C.....	Mauch Chunk....	116 McK.
David Lloyd Swank†.....	G.S....	Mauch Chunk.....	Δ K E.
Philip Allen Swartz.....	C.....	Poughkeepsie, N. Y.	131 M.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Elmer Clayton Taylor.....	Ch.....	Cold Spring.....	145 P.
Reuben Archer Torrey, Jr.....	C.....	Montrose.....	80 N.
Norman Clifford Uhler.....	C.....	Easton.....	R. F. D. 2.
Harry Taylor Updegrove.....	E.M....	Easton.....	Paxinosa Ave.
Roy Irving Walter.....	C.....	Easton...4th and Bushkill.	
Robert Lothrop Ware.....	C.....	Easton...E. Paxinosa ave.	
Arthur Trumbull Warner.....	E.E....	Orange, N. J.....	90 N.
George Albert Wellman.....	C.E....	Covington.....	32 S.
Charles Preston Woodnutt....	E.E....	Williamsport.....	87 N.
Milton K. Yorks.....	C.....	Bloomsburg.....	76 K.
Joseph Henry Zerbey, Jr.....	L.....	Pottsville.....	135 F.
JUNIORS.....			78

SOPHOMORE CLASS.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Harold Knowles Acker.....	E.M....	Washington, D. C....	139 F.
Roscoe Hilton Aldrich, Jr.....	E.M....	Allentown.....	146 P.
James Hezekiah Allen.....	L.....	Kinton, O.....	135 F.
Henry Bunn Anderson.....	Ch.....	Bloomsbury, N. J....	Home.
Raymond Sparrowe Anderson.....	C.E....	Brooklyn, N. Y.....	—
William Aston.....	C.....	Wilkes-Barre.....	30 S.
Allen Eugene Bacon.....	L.....	Wilkes-Barre....	132 Cattell.
Edward Raymond Barnard....	C.....	Hamilton, Ontario....	12 S.
Lawson Henry Bauer.....	Ch.....	Mertztown.....	91 McK.
Harry Edwin Beadell.....	Ch.....	Easton....	1028 Lehigh St.
Frederick Heman Beeman.....	E.E....	Union, N. Y.....	51 S.
Charles Robert Bellamy.....	Ch.....	Scranton.....	79 N.
Frederick Luther Bentley.....	Ch.....	Camden, N. J.....	167 E.
Raymond Chase Bergen.....	C.E....	Trenton, N.J.....	$\phi \Delta \theta$.
Roscoe Conklin Berlin.....	E.M....	Slatington.....	$\phi \Delta \theta$.
Charles Kniseley Boas.....	G.S....	Harrisburg.....	Δ K E.
Van Tuyl Boughton.....	C.E....	Valley Falls, N. Y.	122 McC.
Floyd Thomas Bower.....	C.....	Wind Gap.....	Home.
John George Boyd.....	L.....	Canaseraga, N. Y....	44 S.
Andrew Milton Chalmers†.....	E.M....	Des Moines, Ia.....	—
Robert Albert Christman.....	L.....	Kresgeville.....	49 S.
Rudolph N. Lauer Clymer....	Ch.....	Phillipsburg, N. J.	
		320 So. Main St.	
Myron Judson Conover.....	E.M....	Matawan, N. J....	Δ K E.
William Daniel Conrad.....	C.E....	Reading.....	46 S.
Joseph Patrick Courtney.....	C.....	Worcester, Mass....	—
Harold Croasdale.....	Ch.....	Delaware Water Gap.	
		206 McCartney.	
Howard Vincent Cunningham†.	Ch.....	Pittsburg.....	Σ X.
William Frederick DeMott....	C.E....	Green Village, N. J..	$\phi \Delta \theta$.
Donald VanLear Downs.....	C.E....	Dover, Del.....	Δ K E.
William Findlay Downs.....	C.E....	Dover, Del.....	Δ K E.
George Bache DuBois.....	C.E....	Washington, D. C....	62 B.
James Blair Easter.....	C.E....	Pittsburg.....	Δ K E.
Robert Moore Eyster.....	E.M....	Chambersburg....	99 McK.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Clarence Edgar Feick.....	L.....	Reading.....	232 McCartney.
Theodore Sands Fillmore†.....	C.E.....	Shickshinny.....	Δ K E.
Edgar Kay Ford†.....	E.E.....	Bellwood.....	—
Edwin Clyde Foresman.....	C.....	Ford City....	Prof. Hardy's.
Harold Wilson Furness.....	C.....	Philadelphia.....	86 N.
Rollin Proctor Gilbert.....	Ch.....	Camden, N. J.....	81 N.
Philip Lyman Hand†.....	C.....	Wilkes-Barre....	107 McK.
Horace Morgan Hess.....	C.....	Phillipsburg, N. J...	Kroner's Block.
Wilmer Jacob Hindenach.....	C.....	Durham.....	Home.
Max Hirsch.....	G.S.....	Pittsburg, Pa....	111 McK.
Clifton Burhans Hitt.....	Ch.....	Margaretville, N. Y.	110 McK.
Raymond Solt Hittinger.....	C.....	Easton.....	322 N. 12th.
Samuel Goodman Hoffenstein..	L.....	Wilkes-Barre..	132 Cattell.
Albert Wallace Hogeland.....	C.E.....	Newton.....	65 B.
Oliver Alexander Horner.....	E.E.....	Emmitsburg, Md...	69 B.
John Willis Housel†.....	C.E.....	Easton.....	—
William Patrick Howard.....	E.E.....	Duquesne.....	128 M.
Nicholas Van Reed Hunter....	E.M.....	Wyncote.....	137 F.
Paul Hutchinson.....	L.....	Bayonne, N. J.....	34 S.
Harry Richard Jahn.....	Ch.....	Brooklyn, N. Y.....	—
Raymond Grant Canfield Jolly.	C.....	Orangeville.....	30 S.
Joseph Kadesh†.....	C.....	Easton..	1440 Washington.
Omar Harrison Keller.....	L.....	Doylestown.....	151 P.
William Cummings Kidd.....	C.....	Philadelphia.....	48 S.
Floyd Johnson Kintner.....	C.....	Easton.....	1001 Butler.
Jeremiah Alexander Klotz....	C.....	Northampton....	101 McK.
Walter Harrison Krafft†.....	C.E.....	Brooklyn, N. Y.....	—
Ellsworth Stout Krantz†.....	C.....	Easton..	8th and Northampton.
Hans Heinrich Kudlich.....	E.M.....	Drifton.....	114 McK.
Jacob Servus LaRue.....	C.....	Easton.....	49 S.
Guy Elbert Lavers.....	E.E.....	Easton.....	126 Porter St.
Harry Enders Lehr†.....	C.E.....	Lykens.....	—
Martin Hoffman Lindaberry...	E.E.....	Frenchtown, N. J....	21 S.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
John Sheridan Linn.....	C.....	Paoli.....	48 S.
Lester Long.....	E.M.....	Summit, N. J.....	$\phi \Delta \theta$.
Samuel Bingham Luccock.....	L.....	Oak Park, Ill.....	$\theta \Delta X$.
George McCahon.....	C.....	Kilrea Co., Derry, Ireland,	12 S.
Russell McCauley.....	C.....	Altoona.....	$\phi \Delta \theta$.
Henry Stanley McGarrah.....	E.E.....	Scranton.....	108 McK.
Audley Lytle Mabon.....	C.....	Indiana.....	134 M.
Earl Roy Macintosh.....	C.....	Ambridge.....	79 N.
Jesse Russel Matson.....	G.S.....	Wellsboro.....	75 K.
Philip Maue.....	E.M.....	Hazleton.....	13 S.
Walter Henry Mechler.....	L.....	Jenkintown.....	37 S.
Ambrose Frederick Melan†.....	L.....	Wilkes-Barre.....	118 McK.
John Calvin Merrill.....	L.....	Easton.....	—
William Mewhinney.....	C.....	Easton.....	38 S.
Arthur Richards Miller.....	E.E.....	Holland, N. J.....	22 S.
Frederich Adolphus Miller.....	L.....	Madison, N. J.....	$\theta \Delta X$.
Harry Worthington Mixsell.....	C.E.....	Phillipsburg, N. J..	Home.
Ralph Clark Nash.....	Ch.....	Warren, Ohio.....	136 F.
Walter Arthur Norris.....	Ch.....	Troy, N. Y.....	ΣX .
Jesse Spencer Parsons.....	L.....	Media.....	39 S.
Clarence Gammill Peattie.....	E.M.....	Saratoga Springs, N. Y.	ΣX .
William Walter Perry.....	E.E.....	Easton.....	137 So. 13th.
Carl Seib Rankin.....	C.E.....	Scranton.....	70 B.
James Henry Reeder.....	C.E.....	Hughesville, Pa..	131 McC.
Archibald Murray Richmond.....	C.....	Boonton, N. J..	109 McK.
John Oswald Rinek.....	E.M.....	Easton.....	422 Reeder.
John Rosenberry Rosen- berry, Jr.....	E.E.....	Easton.....	34 S.
John Herbert Rumbaugh.....	L.....	Mt. Pleasant.....	$\theta \Delta X$.
Jesse Earl Schelling.....	E.E.....	Phillipsburg, N. J.....	213 Chambers
Irvin Schick.....	E.M.....	Hazleton.....	14 S.
Arthur Barber Schooley.....	C.E.....	Wyoming.....	—
Leon Moyer Schwenk.....	L.....	Perkasie.....	77 K.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Frank Carrie Shand.....	C.E.....	Kingston, N. Y. 231 Clinton Terrace.	
Russell Lewis Shepler†.....	E.E.....	Vandergrift.....	76 K.
Christian Ludwig Siebert†....	G.S.....	Pittsburg	Σ X.
James Robeson Smith.....	E.M.....	Belvidere, N. J... 109	McK
Leland Parker Smith.....	L.....	Blue Point, L. I. 106	McK.
Arthur Dodd Snyder.....	C.....	Harmony, N. J.....	38 S.
Bernice Yorgey Spare.....	C.....	Limerick.....	25 S.
John Elmer Stellwagon.....	L.....	Easton..... 661	Walnut.
Elijah Compton Stewart.....	C.....	Alexandria.....	103 McK.
Archibald Styer.....	C.E.....	Burlington, N. J.....	89 N.
Charles Benjamin Swartz.....	C.....	Poughkeepsie, N. Y. 85	N.
Stanley Judson Thomas.....	Ch.....	Scranton.....	81 N.
Ernest Mortimer Tuttle.....	C.....	Newark, N. J.....	99 McK.
Harry Walter Vetter.....	G.S.....	Belvidere, N. J. 108	McK.
Gus Evans Warden†.....	C.E.....	Endeavor.....	132 M.
William Warfield.....	C.....	Easton..... Chestnut and McCartney.	
William Lambertson White, Jr.	C.E.....	Easton..... East Ave and Monroe.	
Joseph Horton Williams.....	C.E.....	Wellsboro.....	75 K.
Edmond Talmage Witt.....	C.....	Johnstown.....	44 S.
Clarence Ray Wolf.....	C.....	Highspire.....	101 McK.
Robert Woodcock.....	C.E.....	Hollidaysburg	74 K.

SOPHOMORES..... 119

FRESHMAN CLASS, 1912.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Charles Matthaei Addis.....	Ch.....	Newark, N. J.....	146 P.
Clarence Douglas Andrews....	C.E....	Easton.....	341 Reeder.
Harry Adam Anthony.....	E.E....	Easton.....	50 S.
Leslie Mulford Armstrong....	E.E....	Mullica Hill, N. J.....	127 M.
Delbert Strader Bachman....	E.E....	Easton.....	131 So. 4th.
Stanley Matthews Bachman....	L.....	Orange, N. J.....	100 McK.
Edward Leslie Bacon.....	C.....	Bridgeton, N. J.....	87 N.
Horace Ross Baker.....	C.....	New York, N. Y.....	ϕ Δ θ .
Gordon Harold Bannerman....	C.E....	Easton.....	1137 Butler.
Walter Amberson Barnes....	E.M....	Gettysburg.....	67 B.
Walter Carl Barnes.....	C.....	Perth Amboy, N. J....	60 S.
Harold Dumont Beatty.....	L.....	Hoboken, N. J.....	142 P.
Howard Livingstone Benson....	E.E....	Washington, D. C....	168 E.
William Jay Bleakley.....	C.E....	Franklin.....	301 Cattell.
Howard Milton Bliem.....	E.E....	San Antonio, Tex....	149 P.
Ross Herman Boas.....	C.E....	Harrisburg.....	Δ K E.
Gilbert Randolph Bonham....	C.E....	Bridgeton, N. J.....	31 S.
Elwood Sandt Brinker.....	L.....	Easton.....	415 High.
Benjamin Ray Brown.....	C.E....	Honesdale.....	145 P.
Ralph Waldo Brown.....	E.M....	Washington, D. C....	168 E.
Harry Burrows Bubb.....	E.M....	Williamsport.....	98 McK.
John Alfred Burns.....	Ch.....	Avoca.....	172 E.
Milton Oliver Cederquist.....	Ch.....	Titusville.....	97 McK.
Maurice Brice Clagett.....	G.S....	Linden, Md.....	152 P.
Henry Eldredge Cole.....	L.....	Oak Park, Ill.....	θ Δ X.
Philip Lewis Cook.....	C.....	Wyalusing.....	47 S.
William Stewart Corey.....	C.E....	Alpha, N. J.....	Home.
Harry Gladstone Coulter.....	E.E....	Margaretville, N. Y.	110 McK.
William Everett Crater, Jr....	L.....	Easton.....	440 Ferry.
Robert Percy Crawford.....	C.E....	Pittsburg.....	301 Cattell.
Samuel Bowman Creveling....	E.M....	Hazleton.....	13 S.
John Edward Culp.....	E.E....	Harwood Mines.....	153 E.
Herman Anson Dann.....	L.....	Titusville.....	97 McK.
William Franklin Danne-			
hower, Jr.....	L.....	Norristown.....	200 McK.
David Davis.....	L.....	Summit Hill.....	174 E.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
George R. Kaercher Day.....	E.E....	Hazleton.....	θ Δ X.
James Robert Deibert.....	C.E....	Schuylkill Haven.....	—
Ralph Emerson DeKay.....	C.....	Florida, N. Y.....	31 S.
Benyew Harrison DeMott.....	E.E....	Green Village, N. J..	φ Δ θ.
Stanley Taylor Demarest.....	L.....	Hoboken, N. J.....	142 P.
James Gregg Dickey.....	C.E....	Fort Washington.	118 McK.
Albert Wright Donnelly.....	Ch.....	Alpha, N. J.....	Home.
Hennry Baning Duncan.....	G.S....	Bellevue, Del.....	—
John Milton Edwards.....	L.....	Pittsburg.....	—
Paul Williams Emanuel.....	G.S....	Catasauqua.....	θ Δ X.
William Francis Farrell.....	L.....	Wilkes-Barre.....	43 S.
Robert Cumming Ferguson....	C.E....	New York, N. Y...φ Δ θ.	
George Benjamin Fillmore....	E.E....	Shickshinny.....	212 McC.
Gilden Elvin Fisler.....	L.....	Chews, N. J..	140 Bushkill.
James Aloysius Fleming.....	Ch.....	Manchester, N. H.	230 McC.
Lewis Smyser Forney.....	L.....	York.....	607 High.
Edward Grier Fullerton, Jr....	L.....	Wilkes-Barre.....	152 P.
Alexander Richter Gallenkamp.	E.E....	Scranton,	
		231 Clinton Terrace.	
Edwin Samuel Gard, Jr.....	G.S....	Pittsburg.....	—
Albert James Graham.....	E.E....	Easton.....	201 Bushkill.
George Newton Greene.....	C.E....	Philadelphia.....	φ Δ θ.
Louis Eugene Griffith.....	E.M....	Rutherford, N. J..	80 N.
Harold Fetter Grim.....	C.....	Ottsville.....	58 S.
Kenneth Cushing Grinslade...	Ch.....	Leonia, N. J.....	129 M.
William David Gross.....	C.E....	Kingston, N. Y...230 McC.	
Robert Elliot Haas.....	L.....	Allentown.....	φ Δ θ.
Floyd Johnson Hann.....	L.....	Phillipsburg, N. J.,	
		57 Filmore.	
William James Hawley.....	C.E....	Wilkes-Barre..	132 Cattell.
Charles Schuyler Heebner....	E.M....	Philadelphia.....	Δ. K. E.
Jay Calvin Helms.....	E.M....	Riegelsville,.....	Home.
Atcheson Laughlin Hench....	C.....	Pittsburg.....	149 P.
Donald Wilson Henry.....	C.....	Athens.....	162 E.
William Vilas Hill.....	C.E....	Bordentown, N. J...	89 N.
Charles Budd Hixon.....	Ch.....	Bloomsbury, N. J...	Home.
George Maurice Hohl.....	L.....	Easton.....	119 Bushkill.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Harold Mitten Homet.....	E.E....	Camptown.....	35 S.
Roland Stevens Homet.....	C.....	Camptown.....	47 S.
J. Raymond Hoover.....	E.E....	Washington, D. C.....	131 McC.
George Edwin Horr.....	E.M....	Newark, N. J.....	0 Δ X.
John Eilenberg Howell.....	G.S....	Jersey City, N. J.,	132 Cattell.
Robert Carter Howell.....	E.E....	Harmony, N. J.,	The Vanderveer.
Benedict Willard Howes.....	C.E....	Wyoming, N. Y.....	15 S.
Marshal Hunt.....	C.....	Sussex, N. J.....	163 E.
Elmer Lyon Jones.....	C.E....	Scranton.....	86 N.
Paul Schell Kantner.....	L.....	West Easton.....	Main St.
Michael Joseph Kasprzak.....	C.....	Perth Amboy, N. J.....	60 S.
Walter Hamilton Kelley.....	E.E....	Washington, D. C....	33 S.
Harold Creigh Kieffer.....	L.....	Milton.....	—
Merlin Joe Kilbury.....	G.S....	Hornell, N. Y.....	43 S.
Ralph Emerson Kirkpatrick...	G.S....	Butler.....	—
Earl Lee Kohler†.....	E.E....	Gaines.....	73 K.
Jacob Vanderbilt Koontz.....	C.....	Baltimore, Md.....	42 S.
King-fai Kwan.....	C.E....	Hong Kong, China,	232 Cattell.
Warren Woodward LaBarr....	E.E....	Winwood.....	36 S.
Lawrence Brandt Landrine....	L.....	Jersey City, N. J.....	27 S.
George Earl Lear.....	Ch.....	Phillipsburg, N. J.,	—
Albert Rowland Levin.....	G.S....	Beverly, N. J.....	—
Chieu Luan Li.....	C.E....	Shantung, China,	300 Cattell.
Glenn Andrew Lindabury.....	C.E....	Frenchtown, N. J....	21 S.
John David Lindsay.....	C.....	Wilmington, Del....	175 E.
Harry Aaron Lipson.....	L.....	Newark, N. J.....	223 McC.
William Evan Lloyd, Jr.....	E.E....	Bangor.....	106 McK.
Harold John Lockwood.....	E.E....	Newton, N. J.....	69 B.
Irving Kennedy Lovett.....	L.....	Red Bank, N. J....	117 McK.
Kemper Grier McComb.....	C.....	Haddonfield, N. J....	59 S.
Walter Walbridge McComb....	L.....	Tarentum, Pa.,...512	High.
Frederick Don McCoy.....	C.E....	Trenton, N. J.....	82 N.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
George Edward McElroy.....	E.M....	Easton.....	207 Burke.
Culver Barcalon McWilliam...	G.S....	Somerville, N. J. . . .	Δ K E.
Edward Heller Maier.....	C.E....	Bridgeton, N. J. . . .	88 N.
Elmer Leroy Manning.....	E.E....	Highspire.....	121 McK.
George Bushar Markle, Jr....	G.S....	Hazleton.....	—
Alexander Fulton Marshall....	G.S....	Shamokin.....	232 Cattell.
* Nicholas Wellington Mathewson.....	L.....	Factoryville.....	—
Frank Louis Napoleon Mayer..	E.M....	Washington, D. C. .	165 E.
Joseph Black Mellick.....	C.E....	Harrisburg.....	136 F.
John Ray Mewhinney.....	C.....	Easton.....	50 S.
Bertrand Frederick Miller....	E.E....	Trenton, N. J. . . .	113 McK.
Daniel John Miller.....	C.E....	Bangor.....	512 High.
Jacob Louis Mosser.....	E.M....	Williamsport, Pa. . . .	—
Robert Walton Mumma.....	E.E....	Steelton.....	157 E.
Harry Clayton Murphy.....	C.....	Vandergrift. . . .	132 Cattell.
Chester Arthur Murtaugh....	C.E....	Easton.....	207 Church.
Agha Buzurkkhan Musa.....	L.....	Tabriz, Persia.....	129 M.
Charles Leonard O'Brien.....	C.....	Overton.....	132 Cattell.
John Thomas Owens.....	L.....	Slatington.....	42 S.
Joseph Daniel Person.....	L.....	East Stroudsburg . . .	56 S.
Frank Roll Powell.....	Ch.....	Scranton.....	232 C.
Edwin Henry Price.....	C.E....	Easton.....	23 S.
Walter William Propst.....	L.....	Archibold.....	176 E.
John Joseph Pryor.....	C.....	Hornell, N. Y. . . .	122 McK.
Edward Joseph Rankin.....	C.E....	Philadelphia.....	—
William Luther Raup, Jr....	E.E....	Milton.....	131 McC.
Austin Hunsicker Reeves.....	C.E....	Clinton, N. J. . . .	95 McK.
Howard Elvin Renkert.....	E.E....	Phillipsburg, N. J.,	120 Bullman.
Marco Tulio Ricaurte†.....	E.E....	Riobamba, Ecuador, S. A.,	2 Clinton Place.
Walter Douglas Rice.....	G.S....	Easton.....	125 Ferry.
Clarence Howard Robinson....	E.M....	Westerly, R. I. . . .	151 P.
Edmund Joseph Roche†.....	L.....	Troy, N. Y. . . .	Σ X.
Elwood Henry Roseberry.....	C.E....	Santa Cruz, Cal. . . .	509 High.

* Died Jan. 16, 1909.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Ernest William Roth.....	Ch.....	Wilkes-Barre	94 McK.
Robert Roy.....	E.E.....	Wellsboro	—
Ernst Heinrich Ruge.....	E.M.....	Apalachicola, Fla.	—
George St. John, Jr.....	E.M.....	Milford.....	98 McK.
Rabbi Bernard Sadler.....	Easton..	Special.....	909 Jackson.
Harold Leslie Savercool.....	E.E.....	Phillipsburg, N. J.,	—
Robert Samuel Schar.....	Ch.....	East Liverpool, Ohio,	100 Cattell.
Victor Raymond Schmidt.....	C.E.....	Nazareth.....	23 S.
Irving Schwed.....	L.....	Somerville, N. J.,	117 So. 4th.
Lloyd Clarence Shank.....	Ch.....	Titusville.....	—
Lester Newton Shellenberger†	E.M.....	Easton.....	610 Broadhead.
Allen Pat Sherwood.....	E.M.....	Wellsboro.....	—
Leigh Browne Shiffer.....	C.....	Easton.....	645 Ferry.
Satoshi Shutow.....	Ch.....	Brooklyn, N. Y.....	166 E.
William Michael Silfies.....	C.E.....	Bath.....	150 P.
William Gayley Simpson.....	C.....	Elizabeth, N. J.....	114 C.
John Lesher Sletor.....	E.E.....	Easton.....	159 So. 4th.
Everett Erma Smith.....	G.S.....	Easton.....	Sullivan.
LeRoy Herbert Snyder.....	Ch.....	Easton	717 Wood.
Marco Aurelio Soto C.....	E.E.....	Alajuela, Costa-Rica.,	200 McC.
Joseph Edward Sowden.....	C.....	Wenonah, N. J.....	72 B.
Holden Spear.....	L.....	Metuchen, N. J.....	131 McC.
Clayton Victor Spicer.....	C.E.....	Williamsport..	231 Cattell.
Chandler Sprague.....	L.....	Haverhill, Mass.,	90 Clinton Terrace.
Harvey Harbaugh Steckel.....	L.....	Slatington.....	φ Δ θ.
John Lander Stewart.....	L.....	Phillipsburg, N. J.,	109 So. Main.
Andrew Tybout Stone, Jr.....	C.E.....	Holidaysburg	77 K.
Charles Edward Straub.....	L.....	Easton.....	43 So. 5th.
Yunion Allan Sze.....	C.E.....	Shanghai, China,	232 Cattell.
Leon James Taylor.....	C.....	Mesopotamia, Ohio...—	—

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Edgar Preston Thomas.....	C.E.....	Warren.....	607 High.
Paul Morgan Thomas.....	C.....	Lima, Ohio.....	57 S.
Herbert Dechaut Traub.....	E.E.....	Pennsburg.....	36 S.
Lynn Alexander Walker.....	C.E.....	Philadelphia.....	128 M.
Robert Legh Warren.....	G.S.....	Shickshinny.....	212 McC.
Harold Sharpe Wentz.....	E.E.....	Scranton.....	—
Alex. Christian Preben Wich- feld.....	C.E.....	Maribo, Denmark,	417 High.
Frank Burtt Wildrick.....	L.....	Columbia, N. J.....	163 E.
Howard Lucas Williams.....	E.M.....	Wilkes-Barre.....	74 K.
William Charles Roberts Wil- liams.....	C.....	Wilkes-Barre.....	117 McK.
Charles Oliver Williamson....	C.....	Easton.....	Paxinosa Ave.
John Andrew Wilson, Jr.....	C.E.....	Landisburg.....	59 S.
Maurice Cleveland Wilson....	L.....	Woodland.....	223 McC.
Thomas Albert Wilson.....	L.....	Binghampton, N. Y.,	131 McC.
Harry Smedley Wolf†.....	Ch.....	Reading.....	232 McC.
George Rodgers Wood.....	L.....	St. Clair.....	164 E.
Leon Harold Woolsey.....	C.E.....	New Paltz, N. Y.,	Lorenzo Bell's
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ABBREVIATION FOR BUILDINGS AND COURSES OF STUDY.

Brd.—Brainerd Hall.

B.—Blair Hall.

E.—East Hall.

F.—Fayerweather Hall.

K.—Knox Hall.

M.—Martien Hall.

McC.—McCartney St.

McK.—McKeen Hall.

N.—Newkirk Hall.

P.—Powell Hall.

S.—South College.

 Δ K E.—Fraternity House. Σ X.—Fraternity House. θ Δ X.—Fraternity House. ϕ Δ θ .—Fraternity House.

C.—Classical.

C. E.—Civil Engineering.

Ch.—Chemical.

E. E.—Electrical Engineering.

E. M. Mining Engineering.

G. S.—General Scientific.

L.—Latin Scientific.

† Reciting on schedule.

—Absent at time of publication of catalogue.

SUMMARY.

Courses.	Seniors.	Juniors.	Sophomores.	Freshmen.	Total.
Graduates.....					16
Classical.....	19	25	32	25	101
Latin Scientific.....	12	13	18	39	82
General Scientific.....	1	2	5	15	23
Civil Engineering.....	15	11	24	39	89
Electrical Engineering....	5	12	12	32	61
Mining Engineering.....	2	9	14	17	42
Chemical.....	6	6	14	15	41
Totals.....	60	78	119	182	455

CLASSIFICATION BY RESIDENCE (Non-graduates).

California..... 1	New Hampshire. 1	Canada..... 1
Delaware..... 5	New Jersey..... 81	China..... 4
Dist. of Columbia 11	New York..... 37	Costa Rica..... 1
Florida..... 1	Ohio..... 6	Denmark..... 1
Illinois..... 3	Pennsylvania... 272	Ecuador..... 1
Iowa..... 1	Rhode Island... 1	Germany..... 1
Maryland..... 4	Texas..... 1	Ireland..... 1
Massachusetts... 2	Virginia..... 1	Persia..... 1

For further information, address "The Registrar, Lafayette College, Easton, Pennsylvania."

LH 1

VOL. 4, NO. 2

FEBRUARY, 1910

BULLETIN
OF
LAFAYETTE COLLEGE

GENERAL CATALOGUE

1909-1910

PUBLISHED QUARTERLY BY LAFAYETTE COLLEGE

Entered as second-class matter November 20, 1906, at Easton, Pennsylvania
under the Act of Congress of July 16, 1894.

40
JOHN LEEBEN
LIBRARY



LAFAYETTE COLLEGE, EASTON, PENNSYLVANIA.

- | | | | |
|-----------------------|------------------------|---------------------|------------------------|
| 1 Pardee Hall. | 14 Martien Hall. | 29 Prof. Peck. | 41 to 44 Tennis Courts |
| 2 South College. | 15 McKeen Hall. | 30 Prof. Owen. | 45 Greenhouse. |
| 3 Gayley Hall of | 16 Newkirk Hall. | 31 Prof. Wyso. | 47 Zeta Psi. |
| 4 Chemistry. | 17 Knox Hall. | 32 Prof. Meck- | 48 Phi Kappa Psi. |
| 5 Observatory. | 18 Blair Hall. | lin. | 49 Chi Phi. |
| 6 Jenks Biological | 19 Delta Kappa Epsi- | 33 Prof. Coffin. | 50 Central Heating |
| 7 Laboratory. | lon. | 34 Prof. March, Jr. | Plant. |
| 8 Private Laboratory. | 20 Phi Delta Theta. | 35 Prof. Hart. | |
| 9 College Office. | 21 Theta Delta Chi. | 36 Prof. Raschen | |
| 10 Gymnasium. | 22 Sigma Chi. | 37 Mr. Smith. | |
| 11 Van Winkle Li- | 23 Prof. Davison. | 38 Prof. March. | |
| 12 brary. | 24 Prof. Youngman. | 39 Field House. | |
| 13 Brainerd Hall. | 25 Prof. Hardy. | 40 Students' | |
| 14 East Hall. | 26 Prof. Hall. | Clubs. | |
| 15 Powell Hall. | 27 Prof. Lyle. | | |
| 16 Fayerweather Hall. | 28 President Warfield. | | |

2 and 11 to 18—Dormitories.



GROUNDS AND BUILDINGS
 OF
 LAFAYETTE COLLEGE.

B U L L E T I N O F
LAFAYETTE COLLEGE

INCLUDING THE COURSES OF STUDY
IN THE
CLASSICAL *and* SCIENTIFIC
DEPARTMENTS
AND THE
DEPARTMENTS *of* CIVIL, MINING *and*
ELECTRICAL ENGINEERING,
and of CHEMISTRY

SEVENTY-EIGHTH YEAR

1909-1910

EASTON, PENNSYLVANIA

1910

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1909							1910							1911														
JULY							JANUARY							JULY							JANUARY							
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1909

October 20, Wednesday.....Founder's Day.

December 22, Wednesday... First term ends.

1910.

January 6, Thursday.....Second term begins.

January 27, Thursday Day of Prayer for Colleges.

February 22, Tuesday.....Senior Prize Debate.

March 23, Wednesday.....Second term ends.

April 7, Thursday.....Third term begins.

May 16, Monday..... Junior Oratorical Contest.

May 26-31.....Final Examinations of the Senior Class.

May 30, Monday.....Memorial Day, Barge Oratorical Contest.

June 14-18.....Examinations of lower classes.

June 19, Sunday.....Baccalaureate Sermon.

Sermon before the Brainerd Society.

June 20, Monday.....Senior Class Day and Concert.

June 21, Tuesday.....Literary Societies and Class Reunions.

June 22, Wednesday.....Commencement Exercises.

June 23, Thursday.....Examinations for Admission.

September 12, Monday.....Registration for Entrance.

September 13-14.....Examinations for Admission.

September 15, Thursday. . . . College year begins.

October 26, Wednesday.....Founder's Day.

November 24, Thursday.....Thanksgiving Day.

December 21, Wednesday...First term ends.

1911.

January 5, Thursday.....Second term begins.

January 26, Thursday Day of Prayer for Colleges.

February 22, Wednesday....Senior Prize Debate.

March 22, Wednesday.....Second term ends.

LAFAYETTE COLLEGE.

Lafayette College is situated at Easton, Pa., upon a site of remarkable beauty, overlooking the confluence of the Delaware and Lehigh rivers. It is thoroughly furnished with the buildings and apparatus to do the work of a progressive college and polytechnic school, and also with the equipment, so important in this age, for a healthful and wholesome student life. Its large and able faculty represent the best traditions of scholarship as well as the recent extensions of scientific knowledge and the newer methods of research. It frankly recognizes its obligation to give its students training, as well as the opportunities for acquiring knowledge, and to make its discipline include moral and spiritual culture. Recent revisions of the requirements for admission and of the course of study have been made. It will be found that these changes meet the demands of the day for liberty of choice without sacrificing the supreme consideration of thoroughness.

Easton is a railroad center and easily accessible from all directions. It is about seventy-five miles from New York, seventy from Philadelphia, eighty from Scranton and one hundred from Wilkes-Barre and Harrisburg. The Lehigh Valley, Pennsylvania, N. J. Central, Phila. & Reading, D. L. & W., and L. & H. R. Railways afford convenient and rapid facilities for railway travel. It is also an important industrial center, and there are many advantages afforded the students in the Technical courses by its location. Its situation insures the most perfect conditions for the promotion of health.

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MEETING OF THE TRUSTEES.

Thursday, February 10, 1910.....	WINTER MEETING.
Tuesday, June 21, 1910.....	COMMENCEMENT WEEK.
Wednesday, October 26, 1910.....	FOUNDERS' DAY.

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LAFAYETTE COLLEGE.

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Tutor in Latin.

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Instructor in Modern Languages.

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Director of Physical Training.

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Instructor in Physics.

PAUL SARGENT WORTH, A.B.,
Tutor in Mathematics and Latin.

JOSHUA LEWIS MINER, A.B.,
Assistant in Cement Laboratory.

WILLIAM TRUMBOWER FOSTER, PH.B.,
Assistant in Biology.

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Clerk.

WILLIAM T. LYLE, C.E.,
Inspector of Buildings.

REV. JOHN F. STONECIPHER, D.D.,
Librarian.

REV. MAURICE A. FILSON, A.M.,
Assistant in Library.

EDWARD HART, PH.D.,
Curator of Gayley Hall, and Librarian of the Henry W. Oliver Library.

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Registrar and Treasurer.

ALBERT MOORE LANE, PH.B.,
Bursar.

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SENIOR CLASS.....The President.
JUNIOR CLASS.....Professors Mecklin and Peck.
SOPHOMORE CLASS.....Professors Hall and Owen.
FRESHMAN CLASS.....Professors Hardy, Raschen and Mr. Smith.

LAFAYETTE COLLEGE

ADMISSION.

Every applicant for admission to the College is expected to report at the College offices and register immediately on his arrival. Before registering he must submit to the Registrar a satisfactory certificate of moral character from his pastor or some other person known to the College authorities, and a diploma or certificate of graduation from the school which he last attended, or, if he be not a graduate, a statement that he leaves the school with the approval of its principal and is honorably dismissed to this College, with a statement of the studies which he has pursued and the course which he desires to pursue. His application having been approved he is admitted to the examinations. Examinations are regularly held on the day following the annual commencement day in June, and the days preceding the first day of the Autumn term in September, and also on the first day of the second and third terms.

REQUIREMENTS FOR ADMISSION TO THE FRESHMAN CLASS.

CLASSICAL COURSE.

Candidates are examined in the following subjects:

Geography (A) and (B).	English.
History (A) and (B).	Latin.
Mathematics (A).	Greek.

(For details of subjects, see pages 13-16).

LATIN SCIENTIFIC COURSE.

Candidates are examined in the following subjects:

Geography (A) and (B).	English.
History (A) and (B).	Latin.
Mathematics (A).	German (A) or French (A).
Physics or Chemistry.	

(Candidates for the Classical and Latin Scientific Course offering Mathematics (A) and (B) can take advanced courses in Mathematics.)

GENERAL SCIENTIFIC COURSE.

Candidates are examined in the following subjects:

Geography (A).	English.
History (A).	German (A) and (B) or French (A).
Mathematics (A).	and (B).
Physics or Chemistry.	

and one of the following subjects Mathematics (B); a Second Modern Language (A) and (B); Latin (Grammar, 4 books of Caesar and 2 orations of Cicero or an equivalent).

CIVIL, MINING AND ELECTRICAL ENGINEERING
AND CHEMICAL COURSES.

Candidates are examined in the following subjects:

Geography (A).	Physics or Chemistry.
History (A).	English.
Mathematics (A) and (B).	German (A) and (B) or French (A) and (B).

DETAILS OF REQUIREMENTS FOR ADMISSION.

GEOGRAPHY (A).—Political or Physical Geography.

GEOGRAPHY (B).—Ancient Geography.

HISTORY (A).—*United States*: Johnston, McMaster or Fiske.

General History: Fisher or Freeman. Such books as Myers' and Swinton's General History are not recommended.

HISTORY (B).—*Roman History* to Augustus, and *Greek History* to Alexander. The requirements are intended to be additional to the requirement in General History, and should be met by

the use of books on Roman and Greek History, such as Myers' "Rome, Its Rise and Fall"; Morey's, Leighton's, or Allen's Roman History, and Morey's or Oman's Greek History.

MATHEMATICS (A).—*Arithmetic:* Complete, including the Metric System.

Algebra: Fundamental principles. Factoring. Fractions.

Simple Equations. Involution. Evolution. Exponents.

Quadratic Equations. Simultaneous Quadratic Equations. Equations Solved as Quadratics. Properties of Quadratic Equations.

Geometry: Plane Geometry entire; as in Wentworth, Wells or Loomis.

MATHEMATICS (B).—*Solid Geometry.*

Algebra: Surds and Imaginaries. Simple Indeterminate Equations. Inequalities. Ratio. Proportions and Variations. Progressions.

Plane Trigonometry: Through the solution of right and oblique triangles (Crawley or an equivalent); candidates should bring their logarithmic tables to the examination.

PHYSICS.—The elementary principles (Avery, Gage, Hall and Bergen or Carhart and Chute).

CHEMISTRY.—Elements of Inorganic Chemistry.

ENGLISH. *Grammar.*—A general examination will be given without special reference to any particular text-book to test familiarity with paradigms and syntactical analysis, and the correct use of English idioms.

Franklin's Autobiography and *Milton's Paradise Lost*, Books I and II.

Prose Composition: The writing of a short essay will be required upon a subject drawn from the foregoing text-books. No candidate will be accepted in English whose work is notably deficient in point of spelling, punctuation, idioms, or division into paragraphs.

The English Requirements Recommended by the Association of Colleges and Preparatory Schools will be accepted in place of Franklin's and Milton's works.

Books to be studied: 1910, 1911, 1912: Shakespeare's *Macbeth*, Milton's *Lycidas*, *Comus*, *L'Allegro*, and *Il Penseroso*, Burke's *Speech on Conciliation*

with America, or Washington's Farewell Address and Webster's First Bunker Hill Oration, Macaulay's Life of Johnson, or Carlyle's Essay on Burns.

Books to be read: 1910, 1911, 1912:

Group I (two to be selected). Shakespeare's *As You Like It*, *Henry V*, *Julius Caesar*, *The Merchant of Venice*, *Twelfth Night*.

Group II (one to be selected). Bacon's *Essays*; Bunyan's *The Pilgrim's Progress, Part I*; The Sir Roger de Coverley Paper in "The Spectator;" Franklin's *Autobiography*.

Group III (one to be selected). Chaucer's *Prologue*; Spenser's *Faerie Queene* (selections); Pope's *The Rape of the Lock*; Goldsmith's *The Deserted Village*; Palgrave's *Golden Treasury (First Series) Books II and III*, with special attention to Dryden, Collins, Gray, Cowper and Burns.

Group IV (two to be selected). Goldsmith's *The Vicar of Wakefield*; Scott's *Ivanhoe*; Scott's *Quentin Durward*; Hawthorne's *The House of the Seven Gables*; Thackeray's *Henry Esmond*; Mrs. Gaskell's *Cranford*; Dickens' *A Tale of Two Cities*; George Eliot's *Silas Marner*; Blackmore's *Lorna Doone*.

Group V (two to be selected). Irving's *Sketch Book*; Lamb's *Essays of Elia*; De Quincey's *Joan of Arc* and *The English Mail Coach*; Carlyle's *Heroes and Hero Worship*; Emerson's *Essays* (selected); Ruskin's *Sesame and Lilies*.

Group VI (two to be selected). Coleridge's *The Ancient Mariner*; Scott's *The Lady of the Lake*; Byron's *Mazeppa* and *The Prisoner of Chillon*; Palgrave's *Golden Treasury (First Series) Book IV*, with special attention to Wordsworth, Keats and Shelley; Macaulay's *Lays of Ancient Rome*; Poe's *Poems*; Lowell's *The Vision of Sir Launfal*; Arnold's *Sohrab and Rustum*; Longfellow's *The Courtship of Miles Standish*; Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur*; Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Evelyn Hope*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *The Boy and the Angel*, *One Word More*, *Herve Riel*, *Pheidippides*.

LATIN—Grammar: The Roman method of pronunciation is used.

Caesar; *Commentaries*, four books, for a portion of which an equivalent in Nepos will be received.

Cicero: *Orations*, seven.

Virgil: *Aeneid*, six books, *Bucolics*.

Prose Composition: Daniell's, or equivalent.

GREEK.—Grammar: Pronunciation according to the written accents and in accordance with the preface to Goodwin's Grammar or Hadley-Allen's, Sections 11, 14, 19, 20, 21.

Xenophon: *Anabasis*, four books for a portion of which an equivalent in The Cyropaedia will be received.

Homer: *Iliad* or *Odyssey*, three books; or

New Testament: *Gospels*, three.

Prose Composition: Collar and Daniell or equivalent.



SOUTH COLLEGE.

THE
JOHN CO
LIBRA

GERMAN (A).—An accurate knowledge of the principles of grammar, especially the inflection of articles, adjectives, pronouns, and nouns; the conjugation of the weak and strong verbs; the uses of the modal auxiliaries; the prepositions and their government; the elementary rules of syntax and word order; to be able to read at sight ordinary German prose. It is believed that this requisite facility can be acquired by reading not less than two hundred duodecimo pages of simple German.

GERMAN (B).—This includes a thorough knowledge of accidence, of the elements of word-formation, and of the principal uses of the prepositions and conjunctions. The candidate should be familiar with the essentials of German syntax, and must possess the ability to translate into German easy English prose; to translate at sight passages from standard classical authors. The reading of at least three hundred and fifty pages in addition to that required under German (A) will develop such ability. For examination no specific authors or work are designated. Each candidate is required to bring a statement from his teacher, mentioning text-books used and authors read, including the number of pages translated.

FRENCH (A).—This embraces a thorough knowledge of the rudiments of grammar, including the inflection of the regular and the more common irregular verbs; the inflection of nouns and adjectives for gender and number; the uses of articles and partitive constructions; the forms and positions of personal pronouns; the uses of the other pronouns. Candidates should be able to read at sight ordinary modern prose. It is believed that this ability is acquired by reading two hundred duodecimo pages from the works of at least three different authors.

FRENCH (B).—Candidates should show a thorough knowledge of accidence, and a familiarity with the essentials of French syntax, especially the uses of the tenses, modes, prepositions and conjunctions. They must be able to translate into French a connected passage of simple English, and to translate at sight standard French authors. This proficiency may be acquired by reading, in addition to that required under French (A), not less than four hundred pages of the works of various standard authors. For examination no special authors or works

are designated. Applicants should present a statement from their teachers setting forth the text-books used and the number of pages translated.

PARTIAL OR SPECIAL COURSES.

In addition to the courses above specified, students may be admitted under exceptional circumstances to pursue courses of study of a special character not leading to a degree. Such students are required to undergo such preliminary examination as may be deemed necessary to ascertain their fitness to pursue the proposed course. When admitted they are subject to the same rules and regulations and the same examinations in the studies pursued as are other undergraduates. On completing their course they will receive, on application, certificates of proficiency in such studies as they have satisfactorily completed.

ADVANCED STANDING.

Candidates for advanced standing are examined not only in the preparatory studies, but also specially in the previous studies of the class they wish to enter, or their full equivalents. No certificate from a preparatory school will be accepted as a substitute for College work.

Students from another College bringing certificates of rank and honorable dismissal are permitted to recite on trial with corresponding rank in this College, until there is sufficient test of their qualifications for admission to regular standing. They will, however, be examined on whatever studies of the course may not be in the curriculum of the College from which they come, unless there are full equivalents.

No student, whether from another College or not, will

be admitted to the Senior Class as a candidate for a degree after the beginning of the second term.

CONDITIONS.

Students who fail to pass in a part of the subjects in which they are examined may be admitted upon the condition that they pass a satisfactory examination on such subjects before the end of the term next after that in which they enter. The number of such conditions with which a student is admitted to the College will be determined in each case by a vote of the Faculty.

CERTIFICATES.

Certificates of the Examination Board of the Association of Colleges and Preparatory Schools of the Middle States and Maryland, of the Regents of the University of the State of New York and of certain approved preparatory schools are received in lieu of examination for entrance. Certificates, which will be accepted only from graduates of regularly prescribed preparatory courses, must be signed by the principal and certify only to work done during school hours. They should be filed with the Registrar before the entrance examination in June. Blank certificates will be furnished upon application. Wherever the certificate does not cover one or more of the requirements of admission or supply a satisfactory equivalent, an examination upon such subject or subjects will be required. Such certificates will not be received after one year from the completion of the period of study for which they are given unless an additional certificate of continued study accompany them.

MATRICULATION.

No student is considered a regular member of the College until after his matriculation, which takes place thirty days after his entrance. During the interval between his admission and matriculation he is, however, in all respects subject to the laws of the College.

DESCRIPTION OF COURSES.

Three courses of study are offered in the Académic department leading to appropriate degrees. These courses have been carefully arranged so as to provide a thorough mental discipline and prepare the student to pursue to advantage the learned professions or to meet the requirements of a business career. The Freshman and Sophomore years are prescribed. The Junior and Senior years are half prescribed and half elective. A very wide choice of studies is provided both by the threefold arrangement of courses and by the numerous electives of the last two years. At the same time continuity and thoroughness are secured by the requirement of a large part of the curriculum.

The Technical courses are prescribed throughout. They are arranged so as to provide in the earlier years a general education of the kind that is indispensable for the successful pursuit of the engineering and chemical professions; and in the later years a thorough professional training.

Every student is expected to arrange a schedule of at least sixteen weekly exercises. These exercises are calculated on the basis of *periods*—the period being the equivalent of one recitation hour or three hours of drawing-room, laboratory, or field work. A lecture which does not require previous preparation may be combined with two hours of practical work in a *period*.

The following courses of study are offered:

CLASSICAL COURSE.

Leading to the Degree of A.B.

LATIN SCIENTIFIC COURSE.

Leading to the Degree of Ph.B.

GENERAL SCIENTIFIC COURSE.

Leading to the Degree of B.S.

CIVIL ENGINEERING COURSE.

Leading to the Degree of C.E.

MINING ENGINEERING COURSE.

Leading to the Degree of E.M.

ELECTRICAL ENGINEERING COURSE.

Leading to the Degree of E.E.

CHEMICAL COURSE.

Leading to the Degree of B.S. in Chemistry.

COURSE NUMBERS.

For description of courses see pages 71-115.

LANGUAGE AND LITERATURE.

- 1- 50 ENGLISH.
- 51- 70 ELOCUTION.
- 71-160 GERMAN AND ROMANCE LANGUAGES.
- 161-200 CLASSICS.
- 201-210 HEBREW.

HISTORY, POLITICAL SCIENCE, AND PHILOSOPHY.

- 221-250 BIBLE.
- 251-310 PHILOSOPHY.
- 311-350 HISTORY.
- 351-400 POLITICAL AND SOCIAL SCIENCE.

SCIENCE AND MATHEMATICS.

- 401-440 MATHEMATICS.
- 441-460 GRAPHICS.
- 461-490 PHYSICS.
- 491-530 GEOLOGY.
- 531-550 ASTRONOMY.
- 551-580 BIOLOGY AND HYGIENE.

CIVIL ENGINEERING.

- 601-610 SURVEYING.
- 611-620 RAILROADS.
- 621-630 MECHANICS.
- 631-640 ROADS AND PAVEMENTS.
- 641-650 MASONRY.
- 651-660 CEMENT AND CONCRETE.
- 661-670 HYDRAULICS.
- 671-680 SEWERAGE.
- 681-690 WATER SUPPLY.
- 691-698 ROOFS AND BRIDGES.
- 699-700 THESES.

MINING ENGINEERING.

- 701-710 MINE SURVEYING.
- 711-730 MINING METHODS.
- 731-740 MINING MACHINERY.
- 741-750 MINE ADMINISTRATION.
- 751-760 MINING LAW.
- 761-770 THESES.

ELECTRICAL ENGINEERING.

- 801-810 ELEMENTS OF ELECTRICAL ENGINEERING.
- 811-820 ALTERNATING CURRENTS.
- 821-830 ELECTRICAL LABORATORY.
- 831-840 POWER GENERATION.
- 841-850 POWER TRANSMISSION.
- 851-860 ELECTRICAL DESIGN.
- 861-870 ENGINEERING ABSTRACTS.
- 871-880 THE TELEPHONE.
- 881-890 ILLUMINATING ENGINEERING.
- 891-900 THESES.

CHEMISTRY.

- 901-950 CHEMISTRY.
- 951-960 METALLURGY.
- 961-970 TECHNICAL GERMAN.
- 971-980 THESES.

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Numbers in parenthesis indicate the year and term in which the subject is given.

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CLASSICAL COURSE.

The Classical Course, which leads to the Degree of Bachelor of Arts, consists of the historic course in the *Arts*, or *Humanities*, and retains the regular character of that course, which has so long been regarded as the foundation of a liberal education.

As the usual preparation for the learned professions, including teaching and journalism, special regard is given to the necessities of these professions, so that in addition to being the well-tried means of securing a broad and liberal culture and an approved foundation of Christian scholarship, it is particularly fitted to prepare for the learned professions. It also affords an excellent preparation for other pursuits, including scientific and technical professions.

The instruction embraces a systematic study of the Bible and the Evidences of Christianity throughout the course, of the Ancient and Modern Languages and their literatures, together with Comparative Philology; Pure and Applied Mathematics; Physics, Chemistry, and the Natural Sciences; Rhetoric and Elocution; Logic and Metaphysics; History and Political Science, and Mental and Moral Philosophy.

SYNOPSIS OF STUDIES.

CLASSICAL COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA 2 AND SOLID GEOMETRY 2†.....	4	402 & 406
OR		
SOLID GEOMETRY‡.....	4	407

* See pages 71-115.

† Entered with Mathematics B, Division A.

‡ Entered with Mathematics A, Division B.

	Periods per week.	Course number.*
GREEK.....	4	161
LATIN.....	4	181
ENGLISH.....	2	I
HYGIENE.....	I	580
THE BIBLE.....	I	221

Second Term.

ALGEBRA†.....	4	403
OR		
ALGEBRA‡.....	4	404
GREEK.....	4	162
LATIN.....	4	182
ENGLISH.....	2	2
ELOCUTION.....	I	51
THE BIBLE.....	I	222

Third Term.

TRIGONOMETRY†.....	4	412
OR		
ALGEBRA‡.....	4	405
GREEK.....	4	163
LATIN.....	4	183
ENGLISH.....	2	3
ELOCUTION.....	I	52
THE BIBLE.....	I	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY†.....	4	418
OR		
TRIGONOMETRY‡.....	4	413
GREEK.....	4	164
LATIN.....	4	184
ENGLISH.....	2	15

*See pages 71-115.

†Entered with Mathematics B, Division A.

‡Entered with Mathematics A, Division B.

	Periods per week.	Course number.*
FRENCH.....	2	126
ELOCUTION.....	1	53
THE BIBLE.....	1	227
THEMES.		

Second Term.

PLANE AND SOLID ANALYTICAL GEOMETRY†.....	4	419
OR		
PLANE ANALYTICAL GEOMETRY‡.....	4	420
GREEK.....	4	165
LATIN.....	4	185
ENGLISH.....	2	11
FRENCH.....	2	127
ELOCUTION.....	1	54
THE BIBLE.....	1	228
THEMES.		

Third Term.

PHYSICS.....	4	461
GREEK.....	4	166
LATIN.....	2	186
FRENCH.....	2	128
GERMAN.....	2	80
CHEMISTRY.....	2	901
ELOCUTION.....	1	55
THE BIBLE.....	1	229
THEMES.		

JUNIOR YEAR.

First Term.

PHYSICS.....	4	462
GERMAN.....	3	81
ELOCUTION.....	1	56
THE BIBLE.....	1	236
THEMES.		

ELECTIVES.

MATHEMATICS.....	4	429
PHILOSOPHY.....	2	251

*See pages 71-115.

†Division A.

‡Division B.

	Periods per week.	Course number.*
GREEK.....	4	167
GEOLOGY.....	2	491
ENGLISH A.....	4	19
CHEMISTRY.....	2	902
BIOLOGY.....	2	551
FRENCH.....	2	129
HISTORY.....	2	321
LATIN.....	2	187
BIOLOGY.....	2	571
ENGLISH B.....	4	41

Second Term.

PHYSICS.....	4	463
PHILOSOPHY.....	3	252
ELOCUTION.....	1	57
THE BIBLE.....	1	237
THEMES.....		

ELECTIVES.

ENGLISH A.....	4	20
MATHEMATICS.....	4	430
GEOLOGY.....	2	492
GREEK.....	2	168
GERMAN.....	2	82
HISTORY.....	2	322
CHEMISTRY.....	2	903
HISTORY.....	2	331
FRENCH.....	2	130
LATIN.....	2	188
BIOLOGY.....	4	552
ENGLISH B.....	4	42
SPANISH (optional).....	2	141
ITALIAN (optional).....	2	151

Third Term.

HISTORY.....	2	351
PHILOSOPHY.....	2	252
ELOCUTION.....	1	58

*See pages 71-115.

	Periods per week.	Course number.*
THE BIBLE.....	1	238
THEMES.		
ELECTIVES.		
ENGLISH A.....	4	21
MATHEMATICS.....	4	431
GEOLOGY.....	2	493
GREEK.....	2	169
GERMAN.....	2	83
PHYSICS.....	2	466, 469
CHEMISTRY.....	2	904
BIOLOGY.....	4	553
FRENCH.....	2	131
LATIN.....	2	189
ENGLISH B.....	4	43

SENIOR YEAR.

First Term.

ASTRONOMY.....	4	536
PHILOSOPHY.....	3	281
ELOCUTION.....	1	59
CHURCH HISTORY..	1	242
THEMES.		

ELECTIVES.

ENGLISH A	4	22
HISTORY.....	2	361
PHILOSOPHY.....	2	253
PHYSICS.....	2	464, 470
CHEMISTRY.....	2	905
INTERNATIONAL LAW.....	2	376
MATHEMATICS.....	2	432
GERMAN.....	2	99
BIOLOGY.....	4	554
ENGLISH B.....	4	44
GREEK.....	2	170
FRENCH.....	2	132

*See pages 71-115.

	Periods per week.	Course number.*
GEOLOGY.....	2	494
LATIN.....	2	190
ANGLO-SAXON (optional).....	1	12

Second Term.

PHILOSOPHY.....	3	301
POLITICAL ECONOMY.....	2	381
ELOCUTION.....	1	60
CHURCH HISTORY.....	1	243
THEMES.		

ELECTIVES.

HISTORY.....	2	352
MATHEMATICS.....	2	433
GERMAN.....	2	100
GEOLOGY.....	2	495
ENGLISH A.....	4	23
BIOLOGY.....	4	555
GREEK.....	2	171
FRENCH.....	2	133 or 135
LATIN.....	2	191
HEBREW.....	2	201
SOCIOLOGY.....	2	391
ENGLISH B.....	4	45
BLACKSTONE.....	2	371
BUSINESS LAW.....	2	372
PHYSICS.....	2	465, 467
CHEMISTRY.....	2	906
ASTRONOMY.....	2	541
HISTORY.....	2	362
ANGLO-SAXON-(optional).....	1	13

Third Term.

PHILOSOPHY.....	2	302
PHILOLOGY.....	3	30
ELOCUTION.....	1	61
THE BIBLE.....	1	244
THEMES.		

*See pages 71-115.

	Periods. per week.	Course number.*
ELECTIVES.		
HISTORY.....	2	353
MATHEMATICS.....	2	434
GERMAN.....	2	101
GEOLOGY.....	2	496
ENGLISH A.....	4	24
BIOLOGY.....	4	556
GREEK.....	2	172
FRENCH.....	2 134 or	136
LATIN.....	2	192
HEBREW.....	2	202
ENGLISH B.....	4	46
BLACKSTONE.....	2	372
PHYSICS.....	2	468
CHEMISTRY.....	2	907
ASTRONOMY.....	2	542
HISTORY.....	2	363
POLITICAL ECONOMY..	2	382
PHILOSOPHY.....	2	302
ANGLO-SAXON (optional).....	1	14

*See pages 71-115.

PARDEE SCIENTIFIC DEPARTMENT.

This Department was organized in 1866, in accordance with the conditions of a gift from Ario Pardee, Esq., of Hazleton, Pa. The original organization has been from time to time greatly enlarged and extended largely through the continued munificence of the founder. There are at present two general courses of study Latin Scientific and the General Scientific, and four technical courses.

LATIN SCIENTIFIC COURSE.

This course, which leads to the Degree of Bachelor of Philosophy, was designed to meet the wishes of those who desire to pursue a course of liberal study without Greek. It is the same as the Classical Course except that the time devoted to the study of Greek in that course is given to the study of modern languages; great importance is paid to the study of the English language under the special direction of Professor Francis A. March, Jr.

SYNOPSIS OF STUDIES.

LATIN SCIENTIFIC COURSE.

The course of study is the same as the Classical Course except as follows:

FRESHMAN YEAR.

German 84-85-86 is substituted for Greek, four periods a week being given to this subject during the three terms.

SOPHOMORE YEAR.

The Bible is read in Latin 230-31-32 instead of Greek. English 16-17-18 and German 87-88-89 are substituted for Greek.

JUNIOR YEAR.

The Bible is read in Latin 239-40-41 instead of Greek. English History 321 is substituted for German 81. German 91-2 or 94-5 or 97-8 are substituted for 82-3.

(For schedule of study of the Classical Course see pages 28-34.)

GENERAL SCIENTIFIC COURSE.

This course leads to the degree of Bachelor of Science, and consists of a curriculum in which Mathematics, the Modern Languages and their Literatures, especially English, and the Natural and Physical Sciences receive principal attention. It includes, however, the more general studies of the Arts Course, such as History, Logic and Rhetoric, Mental and Moral Philosophy.

The Mathematics of this course is the same as the Mathematics of the technical courses, or the Latin Scientific Course, as the student may elect upon entrance. Students electing the mathematics of the technical course may not change unless free from conditions.

SYNOPSIS OF STUDIES.

GENERAL SCIENTIFIC COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA†.....	4	401
OR		
ALGEBRA AND SOLID GEOMETRY‡.....	4	402 & 406
ENGLISH.....	2	I

*See pages 71-115.

†Entered with Mathematics B.

‡Entered with Mathematics A.

	Periods per week.	Course number.*
CHEMISTRY.....	4	911
DRAWING.....	2	441
GERMAN ¹	4	75
OR		
FRENCH ²	4	115
HYGIENE.....	1	580
THE BIBLE.....	1	221

Second Term.

TRIGONOMETRY†.....	5	411
OR		
ALGEBRA‡.....	4	403
ENGLISH.....	2	2
CHEMISTRY.....	2	926
GERMAN ¹	4	76
OR		
FRENCH ²	4	116
DRAWING.....	2	442
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY AND MENSURATION†.....	5	416 & 421
OR		
TRIGONOMETRY‡.....	4	412
ENGLISH.....	2	3
CHEMISTRY.....	2	927
GERMAN ²	4	71
OR		
FRENCH ¹	4	111
DRAWING.....	2	443
THE BIBLE.....	1	223

* See pages 71-115.

† Entered with Mathematics B.

‡ Entered with Mathematics A.

¹ Entered on German.

² Entered on French.

SOPHOMORE YEAR.

First Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY 2 AND DIFFERENTIAL		
CALCULUS 3†.....	5	417 & 426
OR		
ANALYTICAL GEOMETRY‡.....	4	418
ENGLISH.....	2	15
ENGLISH.....	2	16
GERMAN ²	2	72
OR		
FRENCH ¹	2	112
CHEMISTRY.—Analytical Chemistry.....	2	928
THE BIBLE.....	1	224

Second Term.

CALCULUS†.....	5	427
OR		
ANALYTICAL GEOMETRY‡.....	4	419
ENGLISH.....	1	17
CHEMISTRY.....	2	929
GERMAN ²	2	73
OR		
FRENCH ¹	2	113
THE BIBLE.....	1	225
ANGLO-SAXON.....	2	11

Third Term.

PHYSICS.....	4	461
ENGLISH.....	4	18
GERMAN ²	2	74
OR		
FRENCH ¹	2	114
BIOLOGY.....	4	561

* See pages 71-115.

† Entered with Mathematics B.

‡ Entered with Mathematics A.

¹ Entered on German.

² Entered on French.

	Periods per week.	Course number.*
CHEMISTRY.....	2	930
THE BIBLE.....	1	226

JUNIOR YEAR.

First Term.

PHYSICS.....	4	462
HISTORY.....	2	321
ELOCUTION.....	1	56
THE BIBLE.....	1	233

ELECTIVES.

GEOLOGY.....	2	491
ENGLISH.....	4	19
ENGLISH.....	2	41
CHEMISTRY.....	2	931
BIOLOGY.....	2	551
BIOLOGY.....	2	571
FRENCH.....	2	129
GERMAN.....	2	90-93-96

After the First Term, Junior year, the schedule of study for the General Scientific Course is the same as for the Classical Course, except that during the rest of the Junior year the Bible is read in German 234-35 instead of Greek; and German 91-2 or 94-5 or 97-8 is substituted for 82-3. (For schedule of study of the Classical Course see pages 28-34.)

* See pages 71-115.

THE CIVIL ENGINEERING COURSE.

The course in Civil Engineering has been designed to develop the mental faculties of the student in those studies which form the foundation of all branches of Technology with additional training in the subjects classed as Civil Engineering. The course also includes such general subjects, essential to a liberal education, as are shown in the synopsis on pages 43-47.

The graduate is prepared for immediate usefulness in the field and office, and, after a moderate amount of professional experience, to fill positions of trust and importance, not only in his chosen profession, but in allied work in mining, mechanical, electrical and architectural engineering.

CIVIL ENGINEERING LABORATORIES AND EQUIPMENT.

The Department has a large equipment of instruments necessary for the various branches of engineering field practice, including tapes, compasses, transits, levels, plane tables, barometers, standard base line tapes and pulling apparatus, sextants, solar attachments, chronometers, floats and current meters. A twelve-inch portable alt-azimuth instrument, reading to single seconds by micrometer microscopes, and provided with level for double zenith distances, is used for instruction in Geodesy and Practical Field Astronomy. A precision level of the latest design is employed in instruction in precise leveling. The astronomical observatory contains an equatorial

telescope, transit, clock, chronograph, meteorological instruments, etc.

For use in the lecture room there are numerous models of the various types of bridge and roof trusses; several complete sets of full-weight standard rolled sections; numerous full-weight sections of riveted joints, representing bridge and boiler work, hand and power riveting; wall charts; working drawings; photographs; slide rules; and lantern, with reflectoscope. The hydraulic lecture room is directly connected with the laboratory, and the equipment of the latter is used for demonstration purposes before the class.

The Department also has a full-weight pin-connected highway bridge of fifty feet span and fourteen feet roadway weighing twelve tons, together with all false work and tools necessary to erect the same.

The GENERAL TESTING LABORATORY contains one transverse machine of 400,000 pounds capacity for specimens up to twenty-five feet in length and four feet in width, one 200,000-pound, three 100,000-pound screw testing machines and one 60,000-pound hydraulic testing machine arranged for tension, compression and transverse testing; a 4,000-pound wire tester and a small machine for testing cord, twine, etc.; a 4,000-pound transverse machine for specimens up to sixteen feet, and a smaller transverse machine for specimens up to five feet, arranged with micrometers for measuring deflections, and extension meters for measuring fiber deformations. The laboratory also contains a torsion machine of 125,000 inch-pound capacity for specimens up to twenty feet in length and a 10,000 inch-pound torsion machine of the pendulum type for short specimens;

a number of elongation meters of different types, compressometers and smaller micrometers, hand tools, etc., and apparatus for calibrating machines. There are also a number of special apparatus for shearing, punching, bending, etc., tests.

The CEMENT LABORATORY contains three 1,000- and two 2,000-pound machines for testing cement by tensile, compressive, and transverse stress, a machine for moulding briquettes under pressure, a power-driven Boehme Hammer, a ball mill, an automatic sieving apparatus, apparatus for accelerated tests, etc. It is further equipped with large immersion tanks with running water, cement bins, briquette racks, and the necessary moulds, sieves, scales, moist closets, specific gravity apparatus, etc. It also contains a number of slate-top mixing tables, each provided with a moist closet, scales and the necessary hand tools.

The CONCRETE LABORATORY contains a large mixing floor, an immersion tank and the necessary moulds for beams up to fifteen feet in length, moulds for compression specimens, a beam crane and trucks of two tons capacity for the convenient handling of specimens, scales, sieves, measures and storage bins for stone, sand and cement.

The HYDRAULIC LABORATORY contains a vertical pressure tank eighteen feet in height and five feet in diameter, arranged for making experiments on the flow of water through orifices and nozzles under heads up to three hundred feet, and provided with a device by which the orifice plates can be removed while the tank is under pressure; other smaller tanks for use under low heads; a standpipe sixty feet high; two tanks, thirty

feet long for weir experiments and measurements of quantity; a turbine; impulse wheels; a centrifugal pump run by electric motor and provided with electric measuring instruments and transmission dynamometer; rotary disc and reciprocating water meters; a Venturi meter; a weighing tank; absolute and differential pressure gauges; and other appliances for the measuring of water used in experiments and for the testing of meters, motors, nozzles and fire hydrants; as well as arrangements for lecture-room illustrations. There is also connected with the laboratory a boiler plant and a one-million gallon Worthington duplex pump upon which tests are made.

The ROAD MATERIAL LABORATORY contains a rattler for testing paving brick; a Deval abrasion machine for testing road metal; hot oven, scales, immersion tanks, etc.

The SHOP, which is in charge of a skilled mechanic, contains two lathes, a drill press, a planer, a milling machine, a grinder and other necessary appliances for preparation of test specimens, models and apparatus and for repair work.

The LIBRARY contains the best and latest books and periodicals upon engineering subjects and the students are encouraged to make free use of the same.

SYNOPSIS OF STUDIES.

CIVIL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911

* See pages 71-115.

	Periods per week.	Course number.*
GERMAN†.....	4	75
OR		
FRENCH‡.....	4	115
ENGLISH.....	2	1
DRAWING AND LETTERING.....	2	441
THE BIBLE.....	1	221
HYGIENE AND PHYSICAL CULTURE.....	1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	926
GERMAN†.....	4	76
OR		
FRENCH‡.....	4	116
ENGLISH.....	2	2
PROJECTIONS AND LETTERING.....	2	442
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY.....	3	416
MENSURATION AND LOGARITHMS.....	2	421
CHEMISTRY.....	2	927
GERMAN†.....	4	71
OR		
FRENCH‡.....	4	111
ENGLISH.....	2	3
DRAWING AND LETTERING.....	2	443
SURVEYING.....	2	601
THE BIBLE.....	1	223
SUMMER SCHOOL IN SURVEYING (in vacation).		
Three weeks.....		602

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426

* See pages 71-115.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
PHYSICS.....	4	461
GERMAN†.....	2	72
or		
FRENCH†.....	2	112
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2	444
SURVEYING.....	2	603
THE BIBLE.....	1	224
THEME.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
PHYSICS.....	4	462
GERMAN†.....	2	73
or		
FRENCH†.....	2	113
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2	445
RAILROADS.....	2	611
THE BIBLE.....	1	225
THEME.		

Third Term.

GERMAN†.....	2	74
or		
FRENCH†.....	2	114
ENGLISH.....	2	4
PHYSICS.....	4	463
MACHINE DRAWING.....	2	446
APPLIED MECHANICS.....	4	622
RAILROADS.....	2	612
THE BIBLE.....	1	226
SUMMER SCHOOL IN SURVEYING (in vacation).		
Three weeks.....		613
THEME.		

* See pages 71-115.

† Entered on German. -

‡ Entered on French.

JUNIOR YEAR.

First Term.

	Periods per week.	Course number.*
METALLURGY.....	2	951
CRYSTALLOGRAPHY.....	2	511
APPLIED MECHANICS.....	4	623
RAILROADS.....	3	614
MECHANICS OF MATERIALS.....	4	624
CEMENT.....	2	651
PRACTICAL ELECTRICITY.....	2	804
THE BIBLE.....	1	233
THEME.		

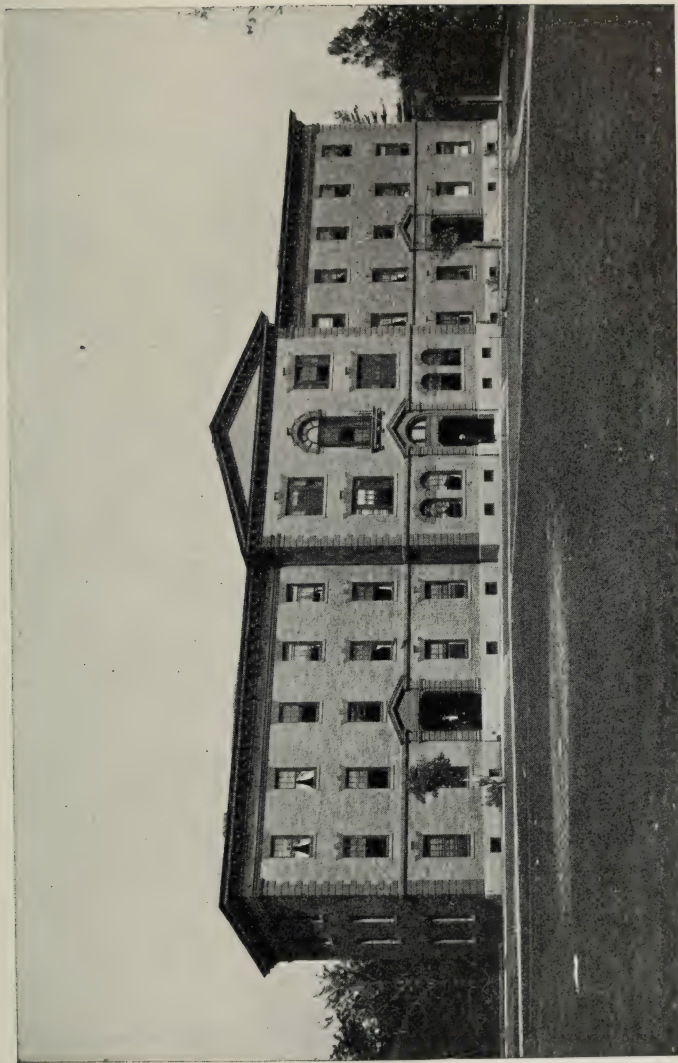
Second Term.

STEAM ENGINE.....	4	476
PETROGRAPHY.....	2	512
SPANISH (optional).....	2	141
ITALIAN (optional).....	2	151
MECHANICS OF MATERIALS.....	4	625
PRACTICAL ELECTRICITY.....	2	805
CONCRETE.....	2	652
RAILROADS.....	2	615
ROADS AND PAVEMENTS.....	2	631
THE BIBLE.....	1	234
THEME.		

Third Term.

MINERALOGY (systematic).....	2	513
SANITARY BIOLOGY.....	2	561
SPANISH (optional).....	2	142
ITALIAN (optional).....	2	152
CONCRETE, REINFORCED.....	2	653
RAILROADS.....	2	616
MASONRY.....	2	641
HYDRAULICS.....	3	661
FRAMED STRUCTURES.....	2	690
THE BIBLE.....	1	235
THEME.		

* See pages 71-115.



MARTIEN, FAYERWEATHER AND POWELL HALLS.

SENIOR YEAR.

First Term.

	Periods per week.	Course number.*
GENERAL GEOLOGY.....	2	516.
DESCRIPTIVE ASTRONOMY.....	2	531
ROOFS AND BRIDGES.....	2	691
ROOF DESIGN.....	1	694
GRAPHIC STATICS.....	1	698
HYDRAULICS.....	3	662
MASONRY DESIGN.....	2	642
SEWERAGE.....	2	671
THE BIBLE.....	1	242
THEME.		

Second Term.

POLITICAL ECONOMY.....	2	381
GENERAL GEOLOGY.....	2	517
PRACTICAL ASTRONOMY.....	2	541
ROOFS AND BRIDGES.....	4	692
BRIDGE DESIGN.....	2	695
SEWERAGE DESIGN.....	2	672
WATER SUPPLY.....	3	681
THE BIBLE.....	1	243
THEME.		

Third Term.

PRACTICAL ASTRONOMY.....	2	542
ROOFS AND BRIDGES.....	3	693
BRIDGE DESIGN.....	5	696
BRIDGE ERECTION.....	(two days)	697
WATER SUPPLY DESIGN.....	2	682
THESIS.....	2	699
THE BIBLE.....	1	244

* See pages 71-115.

THE MINING ENGINEERING COURSE.

The aim of this course is to provide a good education, to lay a sound foundation in Engineering, and to give special preparation in Mining, Geology, Chemistry, Metallurgy, and Assaying.

Courses in Surveying, Analytical Mechanics, Mechanics of Materials, Materials of Construction, Laboratory Physics, and Railroad Engineering are given.

The courses in Mathematics, Languages, Physics, and Pure Graphics are the same in all the Engineering Departments.

A course in the Theory of Steam Engineering is followed by Graphical Constructions and Computations.

In Mechanical Engineering, after the course in Analytical Mechanics, Mechanics of Materials, Materials of Construction, and Graphic Statics, a term of Machine Design and Construction is given.

In Surveying, the theory and practice extends through first and third years, and includes: Chain, Compass and Transit Surveying; Adjustment of Instruments; Leveling; City Surveying; Topographical Surveying; Railroad Reconnaissance, Location, and Construction, with Profile Plans, Earthwork Calculations, Bills of Material, Estimates, Specifications, and Contracts; Theory of Mine Surveying, and the actual survey of a mine.

Following the course in Electricity as given in Physics, two periods each week for two terms are devoted to

the study of Electrical Machinery with selected laboratory work, having especial reference to the application of electricity to mining operations.

The course in Drawing includes: Elements of Mechanical Drawing, tracings and blue prints; Free-hand Drawing and Lettering; Descriptive Geometry; Topographical Drawing; Graphic Statics; Map Drawing; Machine Drawing and Design. Additional drawing is also required in connection with mining problems.

The work in Chemistry begins with the first term of the Freshman year, and continues, without any break, for two years. Lectures and text-book study are accompanied by recitations and laboratory practice.

Metallurgy is given in the Junior year, and embraces the metallurgy of iron, steel, gold, silver, copper, lead, zinc, etc. Thorough courses are also given in Assaying and Blowpiping.

Particular stress is laid on a thorough course in English, which extends over the first two years. Both German and French are studied during the first two years. Two periods each week for one term are devoted to the study of Political Economy. A theme written on some assigned technical subject is required of the student each term.

In addition to the courses in Mineralogy and Geology, as previously explained, the mining engineers are given a course of two hours each week for one term in the study of Ore Deposits, and a course of the same length is given in Field Geology. Instruction in the classroom will be supplemented, so far as possible, by a study of the different kinds of ore, and of the "country rock" in which they occur. A special course in the modern

methods of determining rocks in thin sections by means of the polarizing microscope, with instruction in the proper methods of preparing and mounting the sections, will be offered; and practice in the ordinary methods of field work in geology, with the mapping and sectioning of a certain region, will be given.

The course in Mining proper begins with the Theory of Mine Surveying and the solution of problems for determining the position of faulted ore bodies. Then follows Prospecting for ore deposits in lodes, beds, and placers; Prospecting for magnetite with the magnetic needle, and borings for water, oil and gas. The study of Rope, Rod, and Diamond Drill Boring is followed by that of Blasting and Excavation. In this connection the various tools, machines, and explosives are studied, together with their application in Blasting and Quarrying. Shaft Sinking, Shaft Boring, and Tunneling are studied, together with the materials for the support of excavated spaces and the methods of their application. While all the methods of Exploitation are investigated, particular attention is given to the mining of soft ore bodies, and of anthracite and bituminous coal. In the treatment of Haulage and Winding, special consideration is also given to the requirements of coal mining. Prominence is given to the study of Ventilation and Lighting because of their great importance in coal mining. The subject of Drainage receives careful treatment. Mining law is studied with reference to locations on public lands, and also with reference to the prevention of mine accidents. The Mechanical Separation of Ores is studied, and designs and reviews of Special Mining Operations are made. The principles involved in de-

termining the values of Mines and Quarries are discussed.

The Mining Engineering students use a separate room as a study. This is provided with an excellent Mining Library, and is supplied with the leading Mining periodicals. By the aid of a topical index, the library is regularly used in the study of the subjects assigned. The student is in this way led to many original sources for information, and becomes acquainted with the prominent works on Mining.

Magnetite, hematite, and limonite iron mines are close at hand, and the anthracite coal mines and zinc mines are easily accessible; these, with extensive quarries of slate, limestone, steatite, granite, serpentine, and sandstone in the vicinity, offer excellent opportunities for the study of mining and quarrying operations.

The Ingersoll-Rand Company, one of the largest manufacturers of mine machinery in the world, is located near Easton. This gives the Mining students the opportunity of seeing the construction of important mine machinery and of testing the machines.

Frequent visits are made to the mines and quarries in the vicinity, and two weeks in the spring vacation are spent at some prominent mining region in the practice of Mine Surveying and in the study of Practical Mining. Students are strongly advised to spend at least one summer vacation during their course in actual work at the mines.

Attendance at the first session of the Summer School of Surveying is required of all Mining Engineering students, and attendance at the second session is strongly recommended.

The student in Mining Engineering have the privilege

of electing additional work in Chemistry, Metallurgy or Mining Geology.

MINING ENGINEERING EQUIPMENT.

In Mechanics and Mechanics of Materials, work is given in the GENERAL TESTING LABORATORY. In Hydraulics, the Mining students make tests in the HYDRAULIC LABORATORY. Laboratory work in Assaying and Metallurgy is given in laboratories connected with the CHEMICAL LABORATORY.

There is a separate Mine Department Library and Reading-room, which contains a large Mining library and is supplied with the leading Mining periodicals.

There is connected with the Department a distinct mine drafting and construction room, and a dark-room for photography and blue-printing.

The Department is equipped with two mine transits, large mine level, aneroid barometers, solar attachments, anemometers, etc., and all the accessory instruments necessary for two complete mine survey outfits.

A projecting lantern with about 1000 slides is used in illustrating lectures. New slides are added each year.

The Department possesses maps, charts, models, photographs, sample collections of ores, small machines and machine parts, working drawings with bills of material, trade catalogues, etc.

ORE DRESSING MILL. The mine laboratory is equipped with a small concentrating plant to demonstrate to the mining students all the principles involved in the concentration of ores. The model mill embodies every feature of a modern concentrating mill.

The equipment includes a Blake crusher, 3 sets of Cornish belt-driven Rolls; an ore feeder, Elevators,

Trommels, 3 five-compartment New Century differential motion Jigs, Concentrating table, round Buddle, Hydraulic Classifier, Spitzkasten and a 1½ in. Centrifugal Pump together with all necessary ore bins, shafting, pulleys, belting, etc.

SYNOPSIS OF STUDIES.

MINING ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods. per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911
GERMAN†.....	4	75
OR		
FRENCH‡.....	4	115
ENGLISH.....	2	1
DRAWING AND LETTERING.....	2	441
THE BIBLE.....	1	221
HYGIENE AND PHYSICAL CULTURE.....	1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	926
GERMAN†.....	4	76
OR		
FRENCH‡.....	4	116
ENGLISH.....	2	2
PROJECTIONS AND LETTERING.....	2	442
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY.....	3	416
MENSURATION AND LOGARITHMS.....	2	421
CHEMISTRY.....	2	927

* See pages 71-115.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
GERMAN†.....	4	71
or		
FRENCH†.....	4	111
ENGLISH.....	2	3
DRAWING AND LETTERING.....	2	443
SURVEYING.....	2	601
THE BIBLE.....	1	223
SUMMER SCHOOL IN SURVEYING (in vacation).		
Three weeks.....		602

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
CHEMISTRY.....	2	928
PHYSICS.....	4	461
GERMAN†.....	2	72
or		
FRENCH†.....	2	112
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2	444
THE BIBLE.....	1	224
THEME.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
CHEMISTRY.....	2	929
PHYSICS.....	4	462
GERMAN†.....	2	73
or		
FRENCH†.....	2	113
ENGLISH.....	1	4
DESCRIPTIVE GEOMETRY.....	3	445
THE BIBLE.....	1	225
THEME.		

* See pages 71-115.

† Entered on German.

‡ Entered on French.

Third Term.

	Periods per week.	Course number.*
APPLIED MECHANICS.....	4	622
GERMAN†.....	2	74
OR		
FRENCH‡.....	2	114
CHEMISTRY.....	2	930
PHYSICS.....	4	463
APPLIED MECHANICS.....	4	622
MACHINE DRAWING.....	2	446
THE BIBLE.....	1	226
THEME.		

JUNIOR YEAR.

First Term.

DIFFERENTIAL EQUATIONS.....	2	437
APPLIED MECHANICS.....	4	623
MINING (Prospecting).....	2	711
ELECTRICAL ENGINEERING.....	2	821
METALLURGY.....	2	951
CRYSTALLOGRAPHY.....	2	511
SURVEYING.....	2	604
THE BIBLE.....	1	233
THEME.		

Second Term.

MECHANICS OF MATERIALS.....	3	627
STEAM ENGINE.....	4	476
METALLURGY.....	2	952
ELECTRICAL ENGINEERING.....	2	822
PETROGRAPHY.....	2	512
SPANISH (optional).....	2	141
MINE SURVEYING.....	2	701
THE BIBLE.....	1	234
THEME.		

SPRING VACATION MINING TRIP.

* See pages 71-115.

† Entered on German.

‡ Entered on French.

Third Term.

	Periods per week.	Course number.*
MECHANICS OF MATERIALS.....	3	628
MINERALOGY (Systematic).....	2	513
MINE ENGINEERING (Blasting and Quarrying)...	2	712-713
HYDRAULICS.....	3	661
METALLURGY.....	2	952
SPANISH (optional).....	2	142
MAP OF MINE SURVEY.		
RAILROADS.....	2	611
THE BIBLE.....	1	235
THEME.		

SENIOR YEAR.

First Term.

GENERAL GEOLOGY.....	2	516
HYDRAULICS.....	3	663
MACHINE DESIGN.....	2	447
MINE CONSTRUCTION.....	2-3	719
MINING (Shafting Sinking, Drifting and Tunneling)	2	714
MINING (Exploitation).....	2	715
THE BIBLE.....	1	242
THEME.		

ELECTIVES.

MINING GEOLOGY.....	2	523
ANALYTICAL CHEMISTRY.....	2	953
MINING.....	2	721

Second Term.

GENERAL GEOLOGY.....	2	517
ASSAYING.....	2	955
POLITICAL ECONOMY.....	2	381
MINING LAW.....	2	751
MINING (Transportation).....	2	716
MINING (Ventilation and Lighting).....	2	717
MINING (Construction).....	2	752
THE BIBLE.....	1	243
THEME.		

* See pages 71-115.

	Periods per week.	Course number.*
ELECTIVES.		
MINING GEOLOGY.....	2	524
ANALYTICAL CHEMISTRY.....	2	954
MINING.....	2	722
<i>Third Term.</i>		
MINING GEOLOGY (Field Geology).....	2	522
MINING GEOLOGY (Economic Geology).....	2	521
MINE ADMINISTRATION.....	2	741
MINING (Mine Drainage).....	3	718
MINING (Construction).....	2	752
ANALYTICAL CHEMISTRY (Elective).....	2	954
ORE DRESSING.....	4	720
THE BIBLE.....	1	244
GRADUATION THESIS.		761

* See pages 71-115.

THE ELECTRICAL ENGINEERING COURSE.

The object of the course in Electrical Engineering is to give thorough instruction in such branches of engineering, both general and electrical, as shall fit the graduate to successfully meet and solve the problems which come to him as a practicing electrical engineer. To this end, stress is laid on the attainment of a broad engineering and scientific training rather than on the specialization along any particular line or lines of Electrical Engineering. The aim is to train neither specialists or artisans, but to give such instruction as shall enable the engineer to build up from the foundation of his knowledge of basic principles such specialized knowledge or reasoning as may be required to successfully meet the problem arising for solution.

The Freshman and Sophomore years are devoted to general instructional and culture courses. Thorough training is given in Mathematics, and Physics is taken throughout the Sophomore year, additional hours in elementary electricity and magnetism being given to the students from the Department of Electrical Engineering, so that they may be especially prepared to take up successfully their particular line of training during the last two years of their course.

Beginning with the Junior year, the fundamental principles of Electrical Engineering are studied in the class-room and worked out in the laboratory, the design room, and in problem work. The aim has been to so

arrange these several lines that they shall be mutually supplemental and thus give the student a clear, general conception of the principles involved, their correlation and relative importance.

This plan is continued throughout the Senior year as well, attention now being paid to the direct application of the theories and principles thus arrived at, to the various phases of present-day commercial practice, consideration being given to the financial and commercial as well as the engineering side.

The graduate is in this way prepared to take up in an effective and intelligent manner any branch of electrical engineering requiring general or special electrical training.

ELECTRICAL ENGINEERING LABORATORIES AND EQUIPMENT.

The laboratories are large and well arranged. The main electrical laboratory is thirty by sixty feet in dimensions, and is fitted up with representative types of continuous and alternating generators and motors, lamp-banks, water rheostats, brakes, etc.; and the necessary instruments are supplied for loading and testing generators and motors.

The laboratories are supplied from the Easton Power Company's station, with two-phase alternating current, at a frequency of sixty cycles. This current is available for testing purposes.

A fifty kilowatt motor-generator set has recently been installed for the purpose of supplying the laboratories with direct current. This set consists of a seventy-five horse power induction motor, directly connected

to two twenty-five-kilowatt, 120-volt direct current dynamos, the current from which is supplied to the laboratories by means of the three-wire system.

In case of need, direct current from the plant of the Easton Power Company is also available.

While designed primarily as a source of direct current, this motor-generator set is so installed as to be available at all times for experimental test by the students.

A portion of the laboratories is fitted up for the more delicate tests required. This consists of two rooms, each being about twenty-two feet square, containing the necessary instruments for accurate testing, among which are a Leeds and Northrup Potentiometer, a Thompson Quadrant Electrometer, D'Arsonval Galvanometers, Wheatstone Bridges, Condensers, etc.

SYNOPSIS OF STUDIES.

ELECTRICAL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911
GERMAN†.....	4	75
OR		
FRENCH‡.....	4	115
ENGLISH.....	2	I
DRAWING AND LETTERING.....	2	441
THE BIBLE.....	1	221
HYGIENE AND PHYSICAL CULTURE.....	1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	926

* See pages 71-115.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
GERMAN†.....	4	76
or		
FRENCH‡.....	4	116
ENGLISH.....	2	2
PROJECTIONS AND LETTERING.....	2	442
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY.....	3	416
MENSURATION AND LOGARITHMS.....	2	421
CHEMISTRY.....	2	927
GERMAN‡.....	4	71
or		
FRENCH†.....	4	111
ENGLISH.....	2	3
DRAWING AND LETTERING..	2	443
SURVEYING.....	2	601
THE BIBLE.....	1	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
GERMAN‡.....	2	72
or		
FRENCH†.....	2	112
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2	444
PHYSICS.....	6	461, 464
THE BIBLE.....	1	224
THEME.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
GERMAN‡.....	2	73
or		
FRENCH†.....	2	113

* See pages 71-115.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
ENGLISH.....	1	5
DESCRIPTIVE GEOMETRY.....	3	445
PHYSICS.....	6	462, 465
THE BIBLE.....	1	225
THEME.		

Third Term.

GERMAN†.....	2	74
FRENCH†.....	2	114
APPLIED MECHANICS.....	4	472
PHYSICS.....	6	463, 466
MACHINE DRAWING.....	2	446
THE BIBLE.....	1	226
THEME.		

JUNIOR YEAR.

First Term.

APPLIED MECHANICS.....	4	473
DIFFERENTIAL EQUATIONS.....	2	437
ELECTRICAL LABORATORY.....	2	821
ELEMENTS OF ELECTRICAL ENGINEERING.....	5	801
ALTERNATING CURRENTS.....	2	811
THE BIBLE.....	1	233
THEME.		

Second Term.

THERMODYNAMICS.....	4	831
MECHANICS OF MATERIALS.....	3	627
ELECTRICAL LABORATORY.....	2	822
ELEMENTS OF ELECTRICAL ENGINEERING.....	4	802
ALTERNATING CURRENTS.....	2	812
THE BIBLE.....	1	234
THEME.		

Third Term.

HYDRAULICS.....	3	661
MECHANICS OF MATERIALS.....	3	628

* See pages 71-115.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
ELECTRICAL LABORATORY.....	2	823
ELEMENTS OF ELECTRICAL ENGINEERING.....	5	803
ALTERNATING CURRENTS.....	2	813
THE BIBLE.....	1	235
THEME.		

SENIOR YEAR.

First Term.

HYDRAULICS.....	3	663
MACHINE DESIGN.....	2	447
ELECTRICAL LABORATORY.....	2	824
ALTERNATING CURRENT CIRCUITS.....	3	814
ELECTRIC POWER TRANSMISSION.....	3	841
ELECTRICAL DESIGN.....	2	851
ENGINEERING ABSTRACTS.....	1	861
THE BIBLE.....	1	242
THEME.		

Second Term.

POLITICAL ECONOMY.....	2	381
BUSINESS LAW.....	2	372
ELECTRICAL LABORATORY.....	2	825
ELECTRIC POWER STATIONS.....	4	832
ALTERNATING CURRENT MOTORS.....	2	815
ELECTRICAL DESIGN.....	2	852
ENGINEERING ABSTRACTS.....	1	862
THE BIBLE.....	1	234
THEME.		

Third Term.

THE TELEPHONE.....	3	871
ELECTRICAL LABORATORY.....	2	826
ILLUMINATING ENGINEERING.....	3	881
ENGINEERING ABSTRACTS.....	1	863
ELECTRICAL RAILWAY ENGINEERING.....	4	842
THESIS.....	2	861
THE BIBLE.....	1	244
GRADUATION THESIS.		

* See pages 71-115.

THE CHEMICAL COURSE.

The aim of this course, which leads to the Degree of Bachelor of Science in Chemistry, is to fit young men for practical work in chemistry, either as chemists in iron and steel works, in manufacturing establishments, or as chemical manufacturers. Great attention is paid to analytical chemistry, and especially to the chemistry of cement and the chemistry and metallurgy of iron and steel. Graduates are fitted to take paid positions as chemists immediately upon graduation. For men of the proper character immediate and remunerative employment can be secured. This course will also be found an excellent preparation for the study of medicine.

Those who take the Chemical course receive the same instruction in mathematics, drawing, modern languages, physics and elementary chemistry up to and including elementary quantitative analysis during Freshman and Sophomore years.

During Junior and Senior years the courses diverge. Those especially interested in metallurgy and in the chemistry of cement and ceramics, the chemistry of the metals receive most of their instruction from Professors Hart and Wysor.

Those interested in Organic Chemistry are in charge of Professor Hart and Mr. Hess. Those interested in Physical Chemistry are instructed by Mr. De Long with the coöperation of Professor Gordon, of the Department of Physics. Those who expect to be Chemical Engineers

are advised by Professors Hart and Wysor with the assistance of Professor Rood, of the Engineering Department, while those interested in tanning will receive instruction from Professor Hart and Mr. Ross with the coöperation of Professor Davison, of the Department of Biology.

Provision is made for the new courses as the need arises. This is possible because the instruction is mainly individual and suited to the needs of each student.

While the instruction centers in the two branches of Chemistry and Metallurgy, the course aims to supply a thorough education along the lines most necessary for a successful career as a responsible chemist.

CHEMICAL AND METALLURGICAL LABORATORIES AND EQUIPMENT.

The Chemical and Metallurgical laboratories are contained in Gayley Hall, a new fire-proof structure built for the use of this Department. There are four large and four smaller laboratories and a shop, besides three stock rooms, two balance rooms, a quiz room, a lecture room, a room containing the museum and the books of the Henry W. Oliver Chemical and Metallurgical Library, and three rooms for instructors.

The two balance rooms adjoin the quantitative laboratory and one of them may be entered from the qualitative laboratory.

The four large laboratories each have desk room for 48 students. Water and gas are supplied to each student, and each room is supplied with air blast and electric current. They are well lighted, and heated by steam. The smaller laboratories are arranged for assaying,

industrial work, gas analysis, microscopic and photographic work, and various other determinations made with the polariscope, spectroscope, calorimeter, etc. For this and other work properly belonging to the department, there is an adequate equipment.

SYNOPSIS OF STUDIES.

CHEMICAL COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911
GERMAN†.....	4	75
OR		
FRENCH‡.....	4	115
ENGLISH.....	2	1
DRAWING AND LETTERING.....	2	441
THE BIBLE.....	1	221
HYGIENE AND PHYSICAL CULTURE.....	1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	912
GERMAN†.....	4	76
OR		
FRENCH‡.....	4	116
ENGLISH.....	2	2
PROJECTIONS AND LETTERING.....	2	442
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY.....	3	416
MENSURATION AND LOGARITHMS.....	2	421
CHEMISTRY.....	4	913

* See pages 71-115.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
GERMAN†.....	4	71
or		
FRENCH†.....	4	111
ENGLISH.....	2	3
DRAWING AND LETTERING.....	2	443
THE BIBLE.....	1	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
CHEMISTRY.....	4	914
GERMAN†.....	2	72
or		
FRENCH†.....	2	112
ENGLISH.....	2	4
PHYSICS.....	4	461
THE BIBLE.....	1	224
THEMES.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
CHEMISTRY.....	4	915
PHYSICS.....	4	462
GERMAN†.....	2	73
or		
FRENCH†.....	2	113
ENGLISH.....	1	5
THE BIBLE.....	1	225
THEMES.		

Third Term.

GERMAN†.....	2	74
or		
FRENCH†.....	2	114
CHEMISTRY.....	4	916

* See pages 71-115.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
PHYSICS.....	4	463
CHEMICAL ARITHMETIC.....	4	917
THE BIBLE.....	1	226
THEMES.		

JUNIOR YEAR.

First Term.

CRYSTALLOGRAPHY.....	2	511
QUANTITATIVE ANALYSIS.....	6	918
THEORETICAL CHEMISTRY.....	2	919
ORGANIC CHEMISTRY.....	2	920
METALLURGY.....	2	951
TECHNICAL GERMAN.....	1	961
BIBLE.....	1	233
THEMES.		

Second Term.

PETROGRAPHY.....	2	512
QUANTITATIVE ANALYSIS.....	4	931
THEORETICAL CHEMISTRY.....	2	925
ORGANIC CHEMISTRY.....	4	921
METALLURGY.....	2	952
TECHNICAL GERMAN.....	1	962
BIBLE.....	1	234
THEME.		

Third Term.

QUANTITATIVE ANALYSIS.....	4	932
THEORETICAL CHEMISTRY.....	2	925
ORGANIC CHEMISTRY.....	4	922
MINERALOGY.....	3	513
SANITARY BIOLOGY.....	2	561
TECHNICAL GERMAN.....	1	963
BIBLE.....	1	235
THEME.		

SENIOR YEAR.

First Term.

QUANTITATIVE ANALYSIS.....	10	933
CHEMICAL TECHNOLOGY.....	2	934

* See pages 71-115.

	Periods per week.	Course number.*
GEOLOGY.....	2	516
TECHNICAL GERMAN.....	1	964
BIBLE.....	1	242

Second Term.

ANALYTICAL CHEMISTRY (Thesis Work).....	6	971
CHEMICAL TECHNOLOGY.....	2	935
ASSAYING.....	2	955
GEOLOGY.....	2	517
ECONOMIC GEOLOGY.....	2	521
POLITICAL ECONOMY.....	2	381
TECHNICAL GERMAN.....	1	965
BIBLE.....	1	243
THEME.		

Third Term.

ANALYTICAL CHEMISTRY (Thesis Work).....	12	972
ECONOMIC GEOLOGY.....	2	521
TECHNICAL GERMAN.....	1	966
BIBLE.....	1	244

* See pages 71-115.

COURSES.

ENGLISH LANGUAGE, ENGLISH LITERATURE, COMPARATIVE PHILOLOGY.

Professors Francis A. March (Prof. Emeritus), F. A. March, Jr., J. W. Tupper, and Messrs. Burrowes and Barrick.

The work in this department aims first, to train the student in speaking and writing English correctly. This training begins with the theme work in the Freshman year and is continued throughout the course.

The work in the upper classes is divided into the study of the language and the study of the literature. Its purpose is the interpretation of masterpieces, the re-thinking of the thoughts of master minds. The study of the language consists of a study of the principles of grammar, rhetoric, etymology, phonetics, prosody, and other material of philological investigation according to the progressive course outlined in Dr. March's *Method of Philological Study of the English Language* and the application of the results of such work to the text of some standard author. Bunyan, Spenser, Chaucer, Shakespeare, Bacon and Milton are taken up in this way, and courses in fiction, and the drama are given associated with an examination of the language of some novel or play. This course ends with the study of Dr. Whitney's *Lectures on Language*.

The work in English Literature consists of a course of lectures beginning with the Elizabethan period and continuing down to the present time. The course ex-

tends over the Junior and Senior years and is accompanied by special reading and by weekly and term reports.

Dr. March's Anglo-Saxon Grammar and Reader is used as the basis for a course in Anglo-Saxon given in connection with the study of the English language.

For training in speaking and writing English correctly every student is required to hand in two themes in every term of his College course after the Freshman year. Many of them are read in class and criticized as time allows. In this work professors of all departments take part. It is desired that students in each department shall write on subjects connected with it in the words and phrases current among experts, and know the precise meaning of these words and phrases. In these matters the professors in each department are authorities.

1-2-3. COMPOSITION AND RHETORIC.—Tri-weekly themes. Long themes and conferences every two weeks. Outside reading. First, second and third terms, Freshman year. Two periods per week.

The text-books used during the course are Gardiner, Kittredge, and Arnold's *Manual of Composition and Rhetoric*, Foster's *Argumentation and Debating*, and Nutter, Hersey, and Greenough's *Specimens of Prose Composition*.

4. ENGLISH LITERATURE AND COMPOSITION.—Preparation 1-2-3. The study of the leading English authors from the Elizabethan period to the present time. Lectures and recitations, outside reading and reports. First, second and third terms, Sophomore year. Two periods per week.

11. ANGLO-SAXON.—March's Anglo-Saxon Grammar and Reader. Second Term, Sophomore year. Two periods per week.

12-13-14. ADVANCED ANGLO-SAXON.—Preparation: 11. March's Anglo-Saxon Grammar and Reader and additional reading as assigned. Gilbert Prize in Old English (see page 145). First, second and third terms, Senior year. One period per week.

15. ENGLISH LANGUAGE.—Trench on the Study of Words. Trench Prize (see page 143). First term, Sophomore year. Two periods per week.
16. ENGLISH LANGUAGE.—Bunyan's Pilgrim's Progress, English Syntax, Rhetorical Forms, Grammatical Equivalents, Essays on Bunyan's Life, Times and Works. First term, Sophomore year. Two periods per week.
17. ENGLISH LANGUAGE.—Spenser's Faery Queen, Etymology, Romance of Chivalry, Spenserian Stanza, Essays on Spenser's Life, Times and Works. Second term, Sophomore year. Two periods per week.
18. ENGLISH LANGUAGE.—Chaucer's Canterbury Tales, Phonetics, Orthographic Forms, Essays on Chaucer's Life, Times and Works. Lounsbury Prize (see page 142). Third term, Sophomore year. Four periods per week.
19. ENGLISH LANGUAGE.—Shakespeare: Study of Macbeth. Lectures, Weekly Essays on Shakespeare's Life, Times and Works. First term, Junior year. Four periods per week.
20. ENGLISH LANGUAGE.—Shakespeare: Study of Hamlet and other Shakespearean Tragedies. Two periods per week. Frances Bacon: Study of the Essays. Lectures, Weekly Essays on Bacon's Life, Times and Works. Two periods per week. Second term, Junior year.
21. ENGLISH LANGUAGE.—Study of Merchant of Venice and other Shakespearean Comedies. Lectures, Weekly reports, Dramatic Criticism. Shakespeare Prize (see page 146). Two periods per week. John Milton: Study of Paradise Lost. Two periods per week. Third term, Junior year.
22. ENGLISH LANGUAGE.—English Fiction. Lectures, Assigned Reading, Book Criticism, Weekly Essays. First term, Senior year. Four periods per week.
23. ENGLISH LANGUAGE.—The English Drama. Lectures and required reading. Two periods per week. John Milton: Study of His Dramatic Works. Weekly Essays on Milton's Life, Times and Works. Two periods per week. The Francis A. March Prize (see page 142). Second term, Senior year.
24. ENGLISH LANGUAGE.—The English Drama. Study of As-

signed Texts. Lectures. Weekly Reports. Third term, Senior year. Four periods per week.

30-31. COMPARATIVE PHILOLOGY.—Whitney's Language and the Study of Language. Third term, Senior year. Three periods per week.

41-42. SIXTEENTH AND SEVENTEENTH CENTURY LITERATURE.—Lectures, weekly reports, assigned reading. First and second terms, Junior and Senior years. Four periods per week.

43. EIGHTEENTH CENTURY LITERATURE.—Lectures, weekly reports, assigned reading. Third term, Junior and Senior years. Four periods per week.

44. THE ROMANTIC POETS, 1790-1832.—Lectures, weekly reports, assigned reading. First term, Junior and Senior years. Four periods per week.

45-46. LATER NINETEENTH CENTURY LITERATURE.—Lectures, weekly reports, assigned reading. Second and third terms, Junior and Senior years. Four periods per week.

41-42-43. Given in 1910-11.

44-45-46. Given in 1909-10.

ELOCUTION.

Prof. March, Jr.

51-52. ELOCUTION.—Delivering of selected pieces. Required in the Classical and Latin Scientific courses. Optional in all others. Second and third terms, Freshman year.

53-54-55. ELOCUTION.—Delivering of selected pieces. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First, second and third terms, Sophomore year.

56-57. ELOCUTION.—Delivering of selected pieces. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First and second terms, Junior year.

58. ELOCUTION.—Delivering of original addresses on chosen subjects. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. Third term, Junior year.

59-60-61. ELOCUTION.—Delivering of unwritten addresses on assigned subjects. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First, second and third terms, Senior year.

GERMAN AND ROMANCE LANGUAGES.

Professors Raschen and Hopkins, and Messrs Hunt and Reybaz.

GERMAN.

Der Deutsche Verein is an organization of students and officers interested in the study of German language and literature, and of German life and culture. Meetings are held fortnightly on Friday. Advanced students and others who desire to keep up their knowledge of German are invited. The programs consist chiefly of conversations, addresses and the singing of German songs.

Courses 71, 72, 73, 74 are prescribed for technical students who have entered on French. 75-76 are prescribed for technical students who have entered on German,

71. ELEMENTS OF GERMAN.—Elements of Grammar and Syntax. Prose Composition followed by reading of easy narrative German prose. Third term. Four periods per week.

72-73-74. INTERMEDIATE GERMAN.—Preparation: 71. Reading of narrative prose of difficult character. Composition. Throughout the year. Two periods per week.

75-76. ADVANCED GERMAN.—Preparation: Entrance German B.—The first two weeks will be devoted to a rapid, thorough review of the principles of syntax. This is followed by composition and reading from modern writers as Riehl, Wildenbruch, Fulda, etc., and the translation of easy scientific German. The second term will be devoted to reading of scientific German of an advanced character. First and second terms. Four periods per week.

80. **ELEMENTS OF GERMAN.**—Prescribed for Sophomores in the Classical Course. This Course, in conjunction with Course 81, aims to give a thorough and accurate training in the rudiments of Grammar; to familiarize the student with spoken German as well as written; for this reason the inductive method will be employed, using German almost entirely from the beginning. In this manner the student is quickly made to acquire both “Sprachgefuehl” and “Sprachmaterial” so as to read German with ease. Composition and translation of easy graduated texts form part of the exercises each hour. Third term, Sophomore year. Two periods per week.
81. **ELEMENTS OF GERMAN (Continued).**—Prescribed for Juniors in the Classical Course. First term, Junior year. Three periods per week.
- 82–83. **INTERMEDIATE GERMAN.**—Preparation: 81. Reading of novels and dramas by modern writers such as Heyse, Keller, Fulda, Mörike, Sudermann. Second and third terms, Junior year. Two periods per week.
- 84–85–86. **ADVANCED GERMAN.**—Preparation: Entrance German A. Prescribed for Freshmen in the Latin Scientific Course. The study of accidence, syntax and etymology will form part of this course. In connection with this, there will be oral practice in German and Composition as well as reading of advanced texts. These texts will be selected so as to vary the reading and to acquaint the student with a variety of style of German writers. In addition to this an easy text will be assigned for outside reading during the second and third terms. First, second and third terms, Freshman year. Four periods per week.
- 87–88. **NINETEENTH CENTURY WRITERS.**—Preparation: 86. Prescribed for Sophomores in the Latin Scientific Course who have entered on German. This course consists of the study of Prose-fiction of the 19th century. The classes will be conducted in German as far as practicable. Written exercises in German will constitute part of the work. First and second terms, Sophomore year. Two periods per week.
89. **HISTORICAL PROSE.**—Preparation: 88. Prescribed for Sophomores who have entered on German. Selected readings from

German historical writers, and from addresses in the Reichstag. Third term, Sophomore year. Two periods per week.

90-91-92. SCHILLER AND GOETHE.—Preparation: 89. The lives and several of the principal works of these authors will be studied. Lectures on the various aspects of these works are given to supplement the studies and readings in biography and criticism assigned. Elective. First, second and third terms, Junior year. Two periods per week.

93-94-95. GOETHE'S FAUST.—Preparation: 92. Alternates with 96-98. The reading and interpretation of Faust, the First Part in its entirety, the Second Part in selected portions. The study will comprise its genesis, significance, ethics, and artistic character. It is open to those who completed the course on Goethe. Elective. First, second and third terms, Junior year. Two periods per week.

96-97-98. HISTORY OF THE GERMAN DRAMA OF THE 19TH CENTURY.—Preparation: 87-89. The reading and criticism of the various types of modern drama together with a study of their sources and influence. (Alternates with 93-95; not given in 1910.) Elective. First, second and third terms, Junior year. Two periods per week.

99-100-101. HISTORY OF GERMAN LITERATURE; from the earliest beginnings to the end of the Eighteenth Century.—Preparation: 87-89 or 90-92. Lectures and collateral reading and study of the literary movements in Germany. First, second and third terms, Senior year. Two periods per week.

FRENCH.

Courses 111, 112, 113, 114, are prescribed for technical students who have entered on German.

111. ELEMENTS OF FRENCH.—Elements of Grammar and Syntax. Prose Composition in connection with reading of easy narrative French prose. Third term. Four periods per week.

112-113-114. INTERMEDIATE FRENCH.—Preparation: 111. Reading from modern standard authors. Composition. Throughout the year. Two periods per week.

Courses 115 and 116 are prescribed for technical students who have entered on French.

- 115-116. ADVANCED FRENCH.**—Preparation Entrance French B. The course will comprise French prose composition and reading of standard French authors. The second term will largely be devoted to reading of scientific treatises. First and second terms. Four periods per week.
- 126. ELEMENTARY FRENCH.**—Prescribed for Sophomores in the Classical and Latin Scientific courses. Fraser and Squair's Grammar; composition; sight reading and translation of easy prose; careful drill in pronunciation. First term, Sophomore year. Two periods per week.
- 127. FRENCH.**—Continuation of foregoing; thorough study of irregular verbs; grammar; composition; translation and sight-reading of more difficult prose selections from Lazare's *Premières Lectures* or selected stories from Dumas fils, Halévy, Lavedan, etc. Second term, Sophomore year. Two periods per week.
- 128. FRENCH.**—Grammar and composition continued; translation and sight-reading from Guerlac's *Standard French Authors*; discussion of the various works of the authors represented. Third term, Sophomore year. Two periods per week.
- 129. FRENCH.**—Readings in French history from Lavis's *Histoire de France*; discussions. First term, Junior year. Two periods per week.
- 130. FRENCH.**—The Novel. Selections from Dumas' *Les Trois Mousquetaires* or Hugo's *Notre Dame*. Second term, Junior year. Two periods per week.
- 131. FRENCH.**—The School of the Realists. Readings from Zola's *Débacle*. Collateral reading in *History of French Literature*. Third term, Junior year. Two periods per week.
- 132. FRENCH.**—The Classical Drama—Tragedy. Study of the works of Corneille, Racine and Rotrou. Lectures. First term, Senior year. Two periods per week.
- 133. FRENCH.**—The Classical Drama—Comedy. Works of Molière. Second term, Senior year. Two periods per week.
- 134. FRENCH.**—Rise of the Romantic School. Hugo's *Ruy Blas* or *Hernani*. Third term, Senior year. Two periods per week.

135. FRENCH.—The Literature of the XVIth Century. Selections from Ronsard, Marguerite de Valois, Marot, Jodelle, etc. The *Pléiade*. Alternates with 133. Second term, Senior year. Two periods per week.
136. FRENCH.—Historical Grammar. Development of French from Latin. Alternates with 133–134. Third term, Senior year. Two periods per week.

SPANISH.

141. SPANISH.—This course is designed to give the elements of Spanish grammar and to enable the student to translate easy prose from English into Spanish and *vice versa*. Optional for all students. Second term, Junior year. Two periods per week.
142. SPANISH.—Continuation of 141. Third term, Junior year. Two periods per week.

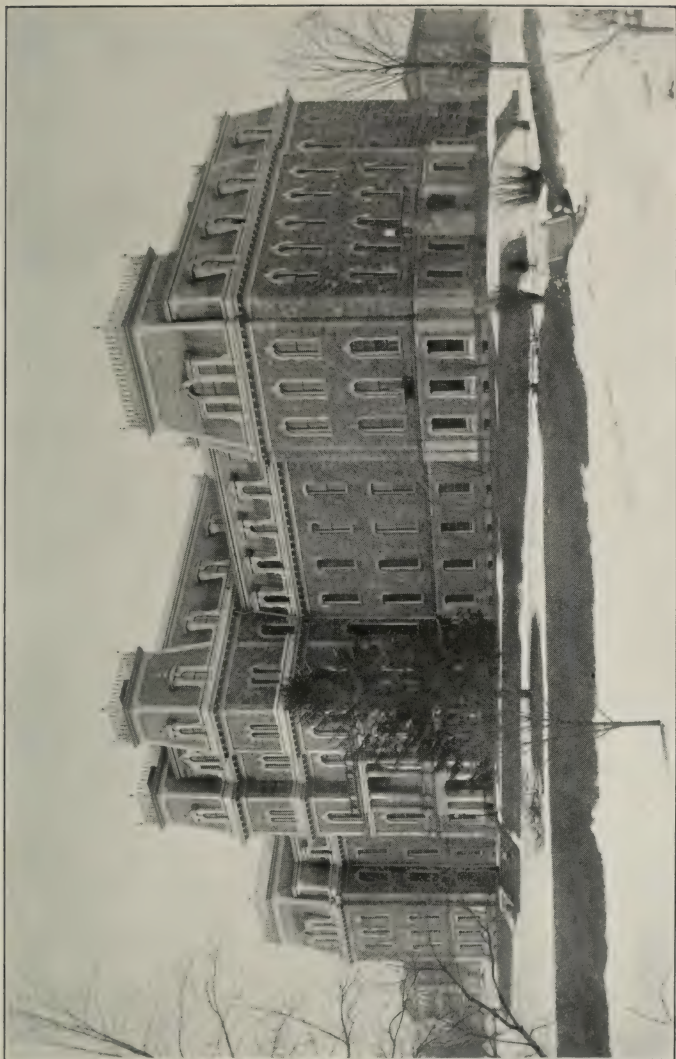
ITALIAN.

151. ITALIAN.—Elements of Italian grammar. Translation of prose from Italian into English and *vice versa*. Optional for all students. Second term, Junior year. Two periods per week.
152. ITALIAN.—Continuation of 151. Third term, Junior year. Two periods per week.

THE GREEK LANGUAGE AND LITERATURE.

Professors Youngman (Prof. Emeritus), Eckels and Mr. Hunt.

The aim of the Greek Course is to be thoroughly grounded in Greek forms, idioms, and syntax—to learn the composition of words, the formation of phrases and the construction of sentences. In the earlier part of the course there is a daily lesson in the grammar, with a test of the student's ability to apply it to the text just read, Etymologies and English derivatives are constantly called for.



PARDEE HALL.

THE
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The best passages of representative authors are translated into the best attainable English. In poetry there is a study of Homer, Sophocles, and Aristophanes; in prose, of Herodotus, for history; of Aeschines and Demosthenes, for oratory. For ethical questions there is a study of Socrates in the *Memorabilia* and the *Apology*.

Attention is directed to Greek life, education, faith, religion, and habits of thought and expression, as compared with our own. The old Greek citizen and the modern American citizen are brought face to face.

Essays are also called for, giving the results of the student's researches. When *De Corona* is read there is a special class debate on the relations of Aeschines and Demosthenes with Philip. When Homer is read there are references to the Bible for comparison of faith, religion, and forms of expression. There is an attempt to bring the students to an intelligent appreciation of the beauty and grace and force in Greek literature, to cultivate the taste, regulate the heart, and discipline the mind.

161. **LYSIAS.**—Against Eratosthenes and several shorter orations. Prose Composition. Old Greek Life. First term, Freshman year. Four periods per week.
162. **HERODOTUS.**—Books VI and VII. Prose Composition. Second term, Freshman year. Four periods per week.
163. **HOMER.**—The *Iliad*—Selections from Books XVIII to XXIV. Greek Literature. Third term, Freshman year. Four periods.
164. **HOMER.**—The *Odyssey*—Selections from Books I to XII. First term, Sophomore year. Four periods per week.
165. **THE EARLIER ATTIC ORATORS.**—Jebb's Selections. History of Greece—Oman. Second term, Sophomore year. Four periods per week.

166. PLATO.—The Apology and Crito—Selections from Xenophon's Memorabilia. Introduction to Greek Philosophy. Third term, Sophomore year. Four periods per week.
167. DEMOSTHENES ON THE CROWN—History.—Period of Demosthenes. Philip and Alexander. Elective. First term, Junior year. Four periods per week.
168. GREEK TRAGEDY.—Sophocles. History of Ancient Drama. Elective. Second term, Junior year. Two periods per week.
169. GREEK TRAGEDY.—Aeschylus or Euripides. Elective. Third term, Junior year. Two periods per week.
170. GREEK COMEDY.—Aristophanes. Elective. First term, Senior year. Two periods per week.
171. THUCYDIDES.—Elective. Second term, Senior year. Two periods per week.
172. PLATO.—Protagoras or Republic. Elective. Third term, Senior year. Two periods per week.

Additional electives, which may also, under some circumstances, be substituted for some of those named above, will be offered from time to time. These will include Lyric and Elegiac Poetry, Theocritus, Lucian, Aristotle's Poetics, New Testament Greek. Junior and Senior electives respectively will usually be open to members of either class, so far as the limitations of the student's schedule permit.

THE LATIN LANGUAGE AND LITERATURE.

Professor Owen and Messrs. Lacey and Worth.

It is the aim of this Department to give the students an intelligent acquaintance with the language, literature, and institutions of Rome, and qualify them for the efficient treatment of these subjects as teachers, or for the further scholarly pursuit of these and kindred studies after graduation if they should be so disposed.

An effort is made to unite accuracy in details with facility in reading within the limits of a reasonable range.

It is kept in mind, also, that the training in this Department should be practically helpful and valuable to those who are to speak and write the English language. With a view to cultivate the power of expression, besides the oral work of the class-room, there are frequent exercises in writing, in which it is sought to faithfully render the author into the English of our literary standards.

181. LIVY.—Books No. XXI-XXII, with Roman History and Latin Prose. First term, Freshman year. Four periods per week.
182. HORACE.—Odes and Epodes. Latin Prose. Second term, Freshman year. Four periods per week.
183. HORACE.—Satires and Letters with Roman Antiquities. Third term, Freshman year. Four periods per week.
184. CICERO.—De Oratore with history of the last Century of the Roman Republic. First term, Sophomore year. Four periods per week.
185. LATIN HYMNS.—Latin Hymns with Early Roman Literature. Second term, Sophomore year. Four periods per week.
186. CICERO.—De Officiis. Third term, Sophomore year. Two periods per week.
187. TACITUS.—Agricola and Germania. Roman Literature of the Silver Age. First term, Junior year. Two periods per week.
188. JUVENAL.—Roman Archaeology, illustrated by an Extensive Collection of Roman photographs. Second term, Junior year. Two periods per week.
189. TACITUS.—Annals. Third term, Junior year. Two periods per week.
190. LUCRETIVS.—First term, Senior year. Two periods per week.

191. EPISTOLARY LATIN.—Pliny and Cicero. Second term, Senior year. Two periods per week.
192. INSCRIPTIONS.—Third term, Senior year. Two periods per week.

THE HEBREW LANGUAGE.

Rev. Robert Robinson.

201. ELEMENTARY HEBREW.—Etymological principles of Hebrew; inflexions and laws of euphonic changes. Elective. Second term, Senior year. Two periods per week.
202. HEBREW (Continued).—Translation of portions of Old Testament History from Hebrew into English, and from English into Hebrew. Elective. Third term, Senior year. Two periods per week.

THE BIBLE.

The President, Professors Youngman, Hardy, Owen, Raschen, Roberts, Lyle, Hopkins, Eckels and Messrs. Smith, Colliton, Hunt, Marquard, Burrowes and Lacey.

In the Freshman year a general survey of the Bible will be made with the purpose of impressing upon the students the character of its contents, the various books and their relation to the whole, and familiarizing them with its actual language and ideas. So far as may be profitable for this dominant purpose instruction will be given in Bible history and geography, but the great object is to make the student familiar with the very words of the English Bible.

The Sophomore year is devoted to a detailed study of one of the synoptic gospels. Those who study Greek use the Greek Testament; those taking the Latin Scientific

course, a Latin version and the Technical students used French and German versions.

The Acts of the Apostles is studied in the Junior year. Special attention is given to the lives and labors of the Apostles and the founding of the Christian Church.

In the Senior year the first half year is devoted to a course on the early history of Christianity in which Uhlhorn's Conflict of Christianity with Heathenism is the text-book; the second half to the external history of the English Bible, its translators and translation.

221-22-23. THE BIBLE.—General survey of the Old Testament and the Life of Christ. Required of all students throughout the Freshman year. One period per week.

224-25-26. THE NEW TESTAMENT.—The Gospels, in French. Required of Technical students throughout the Sophomore year. One period per week.

227-28-29. THE NEW TESTAMENT.—The Gospels, in Greek. Required of Classical students throughout the Sophomore year. One period per week.

230-31-32. THE NEW TESTAMENT.—The Gospels, in Latin. Required of Latin Scientific students throughout the Sophomore year. One period per week.

233-34-35. THE NEW TESTAMENT.—The Acts of the Apostles, in German. Required of Technical and General Scientific students throughout the Junior year. One period per week.

236-37-38. THE NEW TESTAMENT.—The Acts of the Apostles, in the Greek. Required of Classical students throughout the Junior year. One period per week.

239-40-41. THE NEW TESTAMENT.—The Acts of the Apostles, in Latin. Required of Latin Scientific students throughout the Junior year. One period per week.

242-43. CHURCH HISTORY.—Uhlhorn's Conflict of Christianity with Heathenism. Required of all students. First and second terms, Senior year. One period per week.

244. HISTORY OF THE ENGLISH BIBLE.—Required of all students.
Third term, Senior year. / One period per week.

PHILOSOPHY.

Professor Mecklin.

The course in Philosophy is designed to be continuous from the beginning of the first term Junior to the end of the Senior year and consists of both required and elective work. During the Junior year the student gains an acquaintance with the simpler facts of the mental life and their relations to the physiological basis in the sense organs and the nervous system. The problems of the mind are approached from the genetic point of view and the foundations are laid for the courses of the Senior year. In the Senior year the facts of the moral life are presented as a series of problems for the student's solution, including the problems of the origin of moral sentiment, the content of moral judgment, the end or standard, the individual and the common good, moral progress, moral evil and the freedom of the will. The course in Ethics culminates in the idea of a personal God as the basis of the moral order and in the course in the History of Philosophy the theistic arguments receive special attention as they come up in the discussion of the philosophical systems of the various thinkers. Flint's theism or the work of some approved author is made the basis for a discussion of the theistic arguments during the third term Senior. The following is a synopsis of the course.

251. LOGIC.—Text-book, Creighton's Logic. First term. This course is elective for Juniors and required of all Seniors who have not elected it during the Junior year. (Required of class of 1911, third term Junior year.) Two periods per week.

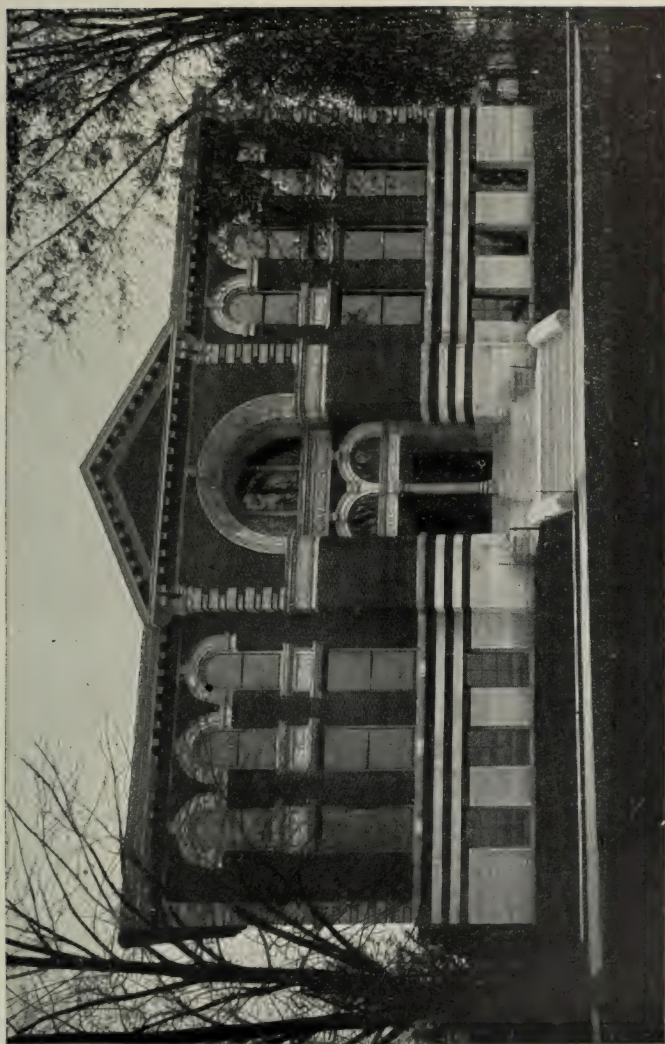
252. **PSYCHOLOGY.**—Lectures and parallel reading. Text-books, Angell's Psychology. Second and third terms, Junior year. Three periods per week second term, and two third term.
253. **ADVANCED PSYCHOLOGY.**—Preparation: 252. Child Psychology, lectures and parallel reading. Elective. First term, Senior year. Two periods per week.
281. **ETHICS.**—Preparation: 252. Lectures, parallel reading, Kant's Ethics, Mill's Utilitarianism and Muirhead's Elements of Ethics. First term, Senior year. Three periods per week.
291. **HISTORY OF PHILOSOPHY.**—Preparation: 252. Lectures and text-book. Text-book, Weber, Rogers or Falckenberg. Assigned parallel reading in Descartes, Spinoza, Leibnitz, Locke, Berkeley, Hume and Kant. Second term, Senior year. Three periods per week.
301. **HISTORY OF EDUCATION.**—Preparation: 252. Text-book, Monroe, History of Education, Bagley, Educative Process, parallel reading. Second term, Senior year. Three periods per week.
302. **THEISM.**—Preparation 252. Lectures and parallel reading. Third term Senior, two periods per week.

HISTORY, POLITICAL AND SOCIAL SCIENCE.

*The President and Professors Owen, Eckels and Roberts,
and Mr. Kirkpatrick*

The work of this department is designed to give such a general knowledge of History and Political Science as belongs to a liberal education. At the same time sufficient work is offered in the electives to prepare those students who desire to take up graduate work or to engage in the practice of law or the public service or teaching. The instruction is given by text-book, by lectures, and by library references, the students reporting the results of their reading partly during the regular work of the class, and partly in the form of essays. The subjects covered by the course are in detail as follows:

311. ANCIENT HISTORY.—Survey of the history of Greece and Rome in connection with the courses in Latin and Greek. Political, Social, literary and philosophical history of each epoch. Classical Geography.
- 321-22. HISTORY OF ENGLAND.—The narrative history of England is made the basis of study, but especial attention is given to the economic, social and intellectual history of the country, and to the development of English institutions. The general aim of this course, in its method, is to prepare for the courses in American History. Green's Short History of the English People is used as a text-book, and the importance of collateral readings is emphasized. First and second terms, Junior year. Two periods per week.
331. AMERICAN HISTORY.—The course in Colonial History is intended to trace the beginnings of the American nation rather than the details of the history of the individual colonies. Emphasis is therefore laid on the European inheritance brought to this country by the colonists, their development of American institutions in the new environment, the expansion of population, the struggle between France and England for North America, the underlying causes of the Revolution, the growth of independence and union. Thwaite's The Colonies and Hart's Formation of the Union are used as text-books, supplemented by lectures, reading and reports. Second term, Junior year. Two periods per week.
351. CONSTITUTIONAL HISTORY.—The United States. A required course dealing with the Constitution from the point of view of its historical development. Fiske's Critical Period of American History is used as an introduction to this course, and it is accompanied by a critical study of several important constitutional documents, such as Magna Charta, the Petition of Right, the Articles of Confederation, and the Ordinance of 1787. Then the Constitution is taken up section by section and studied with reference to its historical development and its subsequent interpretation and construction. Third term, Junior year. Two periods per week.
- 352-53. CONSTITUTIONAL HISTORY.—The United States (Continued). Preparation: 351. Detailed study of the subject,



GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY.

with Bryce's American Commonwealth as an introduction and general guide. Lectures, discussions and written reports on questions of American citizenship. Elective. Second and third terms, Senior year. Two periods per week.

51-62-63. GENERAL CONSTITUTIONAL HISTORY.—A Course in General Constitutional History is begun as a required course in the first term of the Senior year and continued as an elective through the second and third terms. It begins with the origin of the State, and following the plan of Woodrow Wilson's. The State pursues the development down to the present time. The recitations are supplemented by lectures and reading, with written reports of investigations. Two periods per week.

1-72. LAW.—Elective courses in Blackstone's Commentaries and Business Law. Second and third terms, Senior year. Two periods per week.

6. INTERNATIONAL LAW.—The course in International Law undertakes to do little more than to exhibit the fundamental principles which govern international affairs, and by the study of a few important cases to show the method of diplomatic procedure. It is especially intended to give the students the information needed to understand current discussions of foreign relations. Text-book—Lawrence's Principles of International Law. First term, Senior year. Two periods per week.

381-82. POLITICAL ECONOMY.—The course in Political Economy consists of a rapid survey of the principles during second term, Senior year, and of the discussion of practical applications of economic theories during the third term. Special attention, however, is given to the questions which are vital issues of the day, such as Finance and the Tariff. The utmost care is taken to avoid the teaching of party politics under the guise of Economic Science. At the same time the teaching in this Department recognizes the importance of inculcating honest views on the money question and the right of American citizens to know what can be said for the American policy of Protection both in the abstract and in its actual workings. Second and Third terms, Senior year. Two periods per week.

391. SOCIOLOGY.—Preparation: Required studies of Junior year and first term, Senior year. This course is designed to prepare the student for intelligent study of the practical problems of modern society. An analysis of the major forces in the organization of modern society, with some account of the proper relation of the social sciences, is attempted. This is followed by an outline study of the great institutions of civilization, their origin and development. The particular study of typical social problems completes the course. Lectures and dictation are supplemented by the use of Wright's practical Sociology, reports and discussions. Elective, second and third terms, Senior year. Two periods per week.

MATHEMATICS.

*Professors Hardy, Hall and Brasefield, and Messrs.
Smith, Colliton, Marquard, Durkee and Worth.*

It is strongly recommended that algebra be thoroughly reviewed just before admission to college.

401. ALGEBRA.—Binomial theorem, theory of logarithms, probability, variables and limits, series and theory of equations. Text-book—Wentworth's College Algebra. First term, Freshman year. Four periods per week.
402. ALGEBRA.—Preparation: Entrance Mathematics B. Through Ratio, Proportion and Variation. First term, Freshman year. Two periods per week.
403. ALGEBRA COMPLETED.—Preparation: 402. (Continuation of 402.) Second term, Freshman year. Four periods per week.
404. ALGEBRA.—To Progressions. Second term, Freshman year. Four periods per week.
405. ALGEBRA COMPLETED.—(Continuation of 404.) Third term, Freshman year. Four periods per week.
406. GEOMETRY.—Solid Geometry. First term, Freshman year. Two periods per week.
407. GEOMETRY.—Solid Geometry. First term, Freshman year. Four periods per week.

411. TRIGONOMETRY.—The work in this course begins with a rapid review of the elementary Plane Trigonometry. Then follows the advanced Plane Trigonometry, consisting of derivation of formulas and trigonometrical series, solution of right—and oblique-angled triangles and solution of problems involving the practical applications. About one-third of the term is devoted to Solid Trigonometry which is also completed. Text-book—Crawley's *Trigonometry*. Second term, Freshman year. Five periods per week.
412. TRIGONOMETRY.—Preparation: 403, 406. Third term, Freshman year. Four periods per week.
413. TRIGONOMETRY.—Preparation: 405–406. First term, Sophomore year. Four periods per week.
416. ANALYTICAL GEOMETRY.—The work in this subject consists of the Analytical Geometry of two dimensions, including the point, right line and circle; the conics, tangents, diameters, transformation of coördinates, the general equation of the second degree and higher plane curves; also the Analytical Geometry of three dimensions, including the point, the plane and surfaces of revolution. Text-book—Ashton's *Analytic Geometry*. Third term, Freshman year. Three periods per week.
417. ANALYTICAL GEOMETRY (Continued).—First term, Sophomore year. Two periods per week.
418. ANALYTICAL GEOMETRY.—Preparation: 412. Drawing of curves from their equations; accurate demonstrations of propositions. First term, Sophomore year. Four periods per week.
419. ANALYTICAL GEOMETRY.—Preparation: 418. (Continuation of 418.) Four periods per week. Second term, Sophomore year. Four periods per week.
420. ANALYTICAL GEOMETRY.—Preparation: 413. Same as 418. Second term, Sophomore year. Four periods per week.
421. MENSURATION AND LOGARITHMS.—The work includes the mensuration of the ordinary geometrical magnitudes, conic sections and curved surfaces and solids. The prismoidal formula, Simpson's rule, etc., are given. Much practice is

given in logarithmic computations in problems relating to Physics, Mechanics and Engineering. Text-book—Hall's Mensuration. Third term, Freshman year. Two periods per week.

426. DIFFERENTIAL AND INTEGRAL CALCULUS.—The work in the Differential Calculus consists of the differentiation of all the functions of one or more variables, successive differentiation, implicit functions, development of function, evaluation of indeterminate forms, maxima and minima, properties of curves and radius of curvature, together with numerous practical applications in Mechanics. In the Integral Calculus are treated the integration of rational, irrational and transcendental functions, integration by parts and successive integration, rectification of curves, quadrature of plane surfaces, surfaces and volumes of solids, centers of gravity of lines, surfaces and solids, and moments of inertia. Text-book—Hall's Differential and Integral Calculus. First term, Sophomore year. Three periods per week.
427. DIFFERENTIAL AND INTEGRAL CALCULUS (Continued).—Second term, Sophomore year. Five periods per week.
429. DIFFERENTIAL CALCULUS.—Preparation: 419-420. Elective. First term, Junior year. Four periods per week.
430. INTEGRAL CALCULUS.—Preparation: 429. Elective. Second term, Junior year. Four periods per week.
431. CALCULUS.—Preparation: 430. Application of the Calculus to the study of Loci. Elective. Third term, Junior year. Four periods per week.
432. DIFFERENTIAL EQUATIONS.—Preparation: 431. Elective. First term, Senior year. Two periods per week.
- 433-34. THEORY OF FUNCTIONS.—Preparation: 432. Elective. Second and third terms, Senior year. Two periods per week.
436. LEAST SQUARES.—Law of probability of error, adjustment of observations, precision of observations and empirical formulas. The problems are selected with particular attention to the needs of engineers. Text-book—Merriman's Least Squares. Third term, Sophomore year. Three periods per week, for half term.

437. DIFFERENTIAL EQUATIONS.—In this subject are given the principal differential equations of the first order and degree and those of the second order that are of importance in the applied mathematics that follow. Text-book—Hall's Differential and Integral Calculus. First term, Junior year. Two periods per week.

DRAWING AND DESCRIPTIVE GEOMETRY.

Professors Hall and Brasfield, and Messrs. Colliton, Marquard and Durkee.

441. DRAWING AND LETTERING.—Use and testing of drawing instruments and materials; construction of plane geometrical problems; pen and brush shading and tinting; engineering conventions; lettering. First term, Freshman year. Two periods per week.
442. PROJECTIONS AND LETTERING.—Orthographic, isometric and clinographic projections; sketching; free-hand lettering. Faunce, Reinhardt. Second term, Freshman year. Two periods per week.
443. DRAWING AND LETTERING.—Shades and shadows; working drawings with tracings and blue prints; free-hand lettering. Text-books—Faunce's Elements of Mechanical Drawing and Reinhardt's Lettering. Third term, Freshman year. Two periods per week.
444. DESCRIPTIVE GEOMETRY.—Problems on the point, line and plane. Text-book—Hall's Descriptive Geometry. First term, Sophomore year. Two periods per week.
445. DESCRIPTIVE GEOMETRY.—Single curved surfaces; double curved surfaces; intersections and developments; perspective and graphical solutions of problems in Machine Drawing, Surveying, Architecture, etc. Text-book—Hall's Descriptive Geometry. Second term, Sophomore year. Three periods per week.
446. MACHINE DRAWING.—Detailed working-drawings with tracings and blue-prints of screws, joints, gear-wheels, engine parts, etc., are made. The object is to qualify the students

to read working-drawings readily and to construct them according to approved practice and to be able to apply the elements of machine design. Reid and Reid. Third term, Sophomore year. Two periods per week.

447. MACHINE DESIGN.—Application of the principles of Mechanics of Materials to the design and drawing of riveted joints, couplings, bolts, keys, cutters, shafting, journals, pipes, spur and bevel gears, belts, pulleys, wire rope gearing, chains, tanks and engine details. Design of a complete simple machine, as a mine hoist or mine pump for a specific purpose. First term, Senior year. Two periods per week.

PHYSICS.

Professor Gordon, Messrs. Koerber and Seymour.

Courses 461-463 constitute the work in Physics required of all students. Technical students take these courses during their Sophomore year and others the third term of Sophomore and the first two terms of Junior year.

461. MECHANICS AND HEAT.—Experimental lectures, recitations and laboratory work. First or third term, Sophomore year. Four periods per week.
462. ELECTRICITY AND MAGNETISM.—Experimental lectures, recitations and laboratory work. Second term, Sophomore year or first term, Junior year. Four periods per week.
463. SOUND AND LIGHT.—Experimental lectures, recitations and laboratory work. Third term, Sophomore year or second term, Junior year. Four periods per week.
464. PHYSICAL MEASUREMENTS.—Recitations and laboratory work. Advanced experiments in Mechanics and Heat. First term. Two periods per week. Elective. Required for Electrical Engineering students. Sophomore year.
465. ELECTRICAL MEASUREMENTS.—Recitations and laboratory work. The Wheatstone Bridge, Carey Foster Bridge, Murray and Varley Loops, High and Low Resistance, Temperature

Coefficients of Resistance, and other experiments. Second term. Two periods per week. Elective. Required for Electrical Engineering students. Sophomore year.

466. ELECTRICAL MEASUREMENTS.—Recitations and laboratory work. The magnetic properties of iron, capacity, inductance, calibration of voltmeters and ammeters, comparison of electromotive forces. Third term. Two periods per week. Elective. Required for Electrical Engineering students. Sophomore year.
467. ADVANCED ELECTRICITY.—Lectures, recitations and laboratory work. The conduction of electricity through gases and radioactivity. Second term, Senior year. Two periods per week. Elective.
468. ADVANCED ELECTRICITY.—Portions of Electrostatics, electric waves and the relations between electricity and light. Third term, Senior year. Two periods per week. Elective.
469. ELECTROCHEMISTRY.—Lectures, recitations and laboratory work. Conductivity of solutions, velocity of ions, standard cells, concentration cells, polarization, the thermodynamic and osmotic theory of cells. Third term, Junior year. Two periods per week. Elective.
470. OPTICS.—Lectures, recitations and laboratory work. The spectrometer, gratings, Fresnel's mirrors and prism, the interferometer, and the polarimeter. Two periods per week. First term, Senior year. Elective.
472. APPLIED MECHANICS.—Statics. Principles of equilibrium and their application to flexible cords, tackle, jointed structures, frictions, moment of inertia. Kinematics. Rectilinear motion, curvilinear motion, harmonic motion, motions of a rigid body, translation, rotation, plane motion. Third term, Sophomore year. Four periods per week. Required for technical students.
473. APPLIED MECHANICS.—Kinetics. Motion of a particle, translation of a rigid body, rotation, plane motion of a rigid body, work and energy, impulse and momentum. First term, Junior year. Four periods per week. Required for all technical students.
476. THE STEAM ENGINE.—Preparation: 473.—Second term, Junior year. Four periods per week.

MINERALOGY AND GEOLOGY.

Professor Peck.

The course in Geology is continuous and each term's work depends upon that which has preceded. It is desirable that students electing this subject should do so for at least two terms and that they should be familiar with the elements of Physics, Chemistry and Biology. For the work of the Senior year, a knowledge of these subjects is required.

491. DYNAMICAL, STRUCTURAL AND PHYSIOGRAPHICAL GEOLOGY.—Text-book and illustrated lectures. Elective. First term, Junior year. Two periods per week.
492. HISTORICAL GEOLOGY.—Preparation: 491. Stratigraphic sequence of rocks, and fossil forms. Elective. Second term, Junior year. Two periods per week.
493. CRYSTALLOGRAPHY.—Preparation: 492. Crystal forms, properties of crystalline substances, drawing and measurements of crystals. Elective. Third term, Junior year. Two periods per week.
494. PRACTICAL FIELD GEOLOGY.—Preparation: 493. Elective. First term, Senior year. Two periods per week.
495. ADVANCED CRYSTALLOGRAPHY AND ELEMENTARY PETROGRAPHY.—Preparation: 494. Elective. Second term, Senior year. Two periods per week.
496. FIELD GEOLOGY.—Preparation: 495. Elective. Third term, Senior year. Two periods per week.
511. CRYSTALLOGRAPHY.—This course is illustrated with glass and wooden models, and each alternate exercise consists of a practicum at which well-crystallized minerals are studied, and their properties discussed. The latter part of the term is devoted to a brief discussion of the optics of crystals. Text-book—Williams' Elements of Crystallography. First term, Junior year. Two periods per week.

512. **PETROGRAPHY.**—A large collection of hand specimens of rocks with thin sections are used in this study. Text-book—Kemp's Handbook of Rocks. Second term, Junior year. Two periods per week.
513. **MINERALOGY.**—A systematic review of mineral species, more special attention being paid to their chemical and crystallographic relations and to their mode of occurrence in nature. Instruction is given by lectures which are illustrated by a study collection consisting of some two thousand specimens, including the most important species. A course in determinative mineralogy supplements these lectures. The student is required to determine sixty minerals and to write out a description of each. Third term, Junior year. Three periods per week.
516. **GENERAL GEOLOGY.**—Dynamical, Structural and Physio-graphical Geology. The work of the class-room is supplemented by excursions into the neighboring region, and sufficient time is devoted to field work to enable each student to construct a six-inch section up and down the Delaware River at Easton. Text-book—Scott's Introduction to Geology. First term, Senior year. Two periods per week.
517. **GENERAL GEOLOGY.**—Continuation of Course 516. Historical Geology. Accumulations, organic and inorganic, which are of economic importance. Text-book—Scott's Introduction to Geology. Second term, Senior year. Two periods per week.
521. **MINING GEOLOGY. ECONOMIC GEOLOGY.**—Practical geology of the metalliferous deposits. This is a lecture course, but reading is assigned in the following works: "Economic Geology of United States," Ries; "Ore Deposits of the United States and Canada," Kemp; "The Nature of Ore Deposits," Beck; etc. Second term, Senior year. Two periods per week.
522. **MINING GEOLOGY. FIELD GEOLOGY.**—In this course the student makes a detailed field study of an area, from which he constructs a colored geological map and geological sections. Specimens of the different ores are collected and then sections are cut for microscopical examination. Third term, Senior year. Two periods per week.

523. MINING GEOLOGY.—Elective. First term, Senior year. Two periods per week.
524. MINING GEOLOGY.—Elective. Second term, Senior year. Two periods per week.

ASTRONOMY.

Professor Hardy and Mr. Smith.

531. DESCRIPTIVE ASTRONOMY.—Fundamental definitions of the celestial sphere, parallax, refraction, the earth as an astronomical body, the sun, the moon eclipses and the planets. Text-book—Young's Astronomy. First term, Senior year. Two periods per week.
536. DESCRIPTIVE ASTRONOMY.—More detailed course than 531. First term, Senior year. Four periods per week.
- 541-42. PRACTICAL ASTRONOMY.—The use of the sextant in determining time by a single altitude of the sun, by a single altitude of a star, by equal altitudes of the sun, by equal altitudes of a star; in determining latitude by the meridian altitude of a star in any position, by circummeridian altitudes; and in determining longitude by lunar distances. The instrumental constants of the transit instrument and its use in determining longitude. The use of the zenith telescope in determining latitude. The sections of the class are made so small that each student gets considerable practice with the instruments. Second and third terms, Senior year. Two periods per week.

BIOLOGY.

Professor Davison and Mr. Foster.

The work of this Department occupies all of the ten rooms in Jenks Biological Hall. A general laboratory, forty by sixty feet, and four special laboratories well equipped with modern apparatus, in addition to an herbarium and vivarium, provide ample facilities for pursuing practical studies on plant and animal life.

The courses in Biology, excepting Sanitary Biology required for the Civil Engineers and Chemists, are elective only, and consist of work throughout the Junior and Senior years. They are open for election to Classical, Latin Scientific, and General Scientific students. In order to meet the double purpose of a professional preparation and general culture, the courses are so arranged as to provide in each the special knowledge required without sacrificing the ends of general culture and discipline, which is sought in all the undergraduate courses. Those not wishing to take the complete course, and yet desiring to know the meaning of the life forms, the relation of plants and animals to one another and especially to man, and to understand the factors and methods of evolution, should pursue the work of the last two terms of the Junior year and the first term of the Senior year. One may, however, begin his biological studies at any time prior to the second term of the Senior year. The work of the second and third terms of the Senior years is designed for those expecting to enter the professions of teaching or medicine.

551. MAMMALIAN ANATOMY.—This enables the student to secure a definite idea of the structure of his own body, to understand some of the evidences of evolution of animals and realize the unity of structure of the animal kingdom. A dissection of parts of the cat or dog together with studies and demonstrations on certain dissected mammals with special reference to the nervous system makes an excellent preparation for the study of Psychology and Physiology. Elective. First term, Junior year. Two periods per week.
552. VERTEBRATE ZOOLOGY.—The laboratory work involves a study of one or more types representing each of the five classes of vertebrates. The evolution of the various organs and systems and the origin and development of certain forms of

animals together with their habits and natural history furnish fertile topics for recitations and lectures. This course, in connection with General Biology, course 553, gives the student a general survey of the entire animal kingdom. Elective. Second term, Junior year. Four periods per week.

553. GENERAL BIOLOGY.—The morphology and life history of a few types of the invertebrates are studied with a view to understanding the processes of life and the relation of one form of life to another. Darwinism and the allied problems struggle for existence, parasitism, etc., are discussed, and considerable attention is given to the interdependence of animals and plants, and insects and birds. A well-equipped laboratory with microscopes, aquaria and terraria, offering access to numerous specimens living and preserved, furnishes every advantage to those pursuing this course. Elective. Third term, Junior year. Four periods per week.
554. BACTERIOLOGY AND HEALTH.—Preparation: 551, 553 or 571. This work occupies four periods per week during the first term of the Senior year. A considerable amount of laboratory work, supplemented by investigations in a well-equipped library, and by lectures and demonstrations, is applied to a study of the form, habits and use of bacteria, their relation to agriculture, to industrial processes and to disease. Incubators, water baths, sand and domestic filters, and microscopes equipped with oil immersion lenses enable the students to make a practical study of the cause and prevention of disease, including disinfection, disposal of sewage, sanitary analysis of water and milk. The necessity and method of ventilation and natural and artificial immunity are treated in the light of the twentieth century knowledge. Elective. First term, Senior year. Four periods per week.
555. PHYSIOLOGY.—Preparation: 551, 553 or 554. The laboratory work consists of the performance of certain experiments and a microscopic study of the chief organs in man. The recitations and lectures are devoted chiefly to the physiological problems relating to the digestive, vascular, respiratory, excretory

and nervous systems. Elective. Second term, Senior year. Four periods per week.

556. EMBRYOLOGY AND HISTOLOGY.—Preparation: 551 or 552 and 555. The maturation and fertilization of the egg of *Ascaris*, the segmentation of the egg and the formation of the germinal layers in fish and amphibians, and the origin and early development of the chief organs in chick embryos, and the derivation and function of the fetal membranes in birds and mammals constitute the laboratory work. Discussion of these subjects, together with certain questions in cytology, such as the nature of the germ plasm, germinal selection, and heredity, occupy the hours of recitation. A brief study of the chief tissues of some mammal is also made. Each student is required to fix, harden, embed, section, stain and mount material for microscopic work. Twenty compound microscopes, each equipped with three objectives, triple nose piece, and full substage apparatus, in addition to automatic and sliding microtomes, water-baths, incubators, etc., offer excellent opportunities to those preparing for medicine or special biological work. Either Course II or III, and Course VI are required as a preparation for this course. Elective. Third term, Senior year. Four periods per week.

561. SANITARY BIOLOGY.—The cause and prevention of disease, the rôle of bacteria in the septic tank; the effect of polluted water on health; biological analysis of water. The Biological Laboratory is used by students in this course prior to their work in Water Supply and Sewerage. It contains equipment fitted for the study of Sanitary Biology, *viz.*, twenty compound microscopes, a dozen aquaria, several sets of Sedgwick-Rafter apparatus, modern sand and house filters, drying ovens, sterilizers, incubators, fermentation tubes, petri dishes, etc., furnishing the necessary facilities for a practical study of the algae, aquatic animals and bacteria relating to sewage disposal and water supply. Required for Civil Engineers and Chemists. Elective for others. Third term, Junior year. Two periods per week.

571. BOTANY.—The time is largely devoted to the study of the morphology and life history of the lower plants from bacteria

to ferns and an explanation of the physiological processes in plants. The relation of insects to plants and plants to man, together with the problem of breeding new varieties, are some of the practical topics considered. Excellent advantages for pursuing this branch are offered by the well-equipped laboratory and extensive College Herbarium containing representatives of nearly all the mosses, ferns and flowering plants found in Pennsylvania in addition to hundreds of species from other regions of North America. Elective. First term, Junior year. Two periods per week.

HYGIENE AND PHYSICAL CULTURE.

Dr. Updegrove and Mr. Bruce.

580. Lectures on Health and the general principles of Physiology and Anatomy illustrated by diagrams.

PHYSICAL CULTURE.—First aid to the injured. First term, Freshman year. One period per week. Gymnasium drills. Freshman and Sophomore years. Four exercises per week.

CIVIL ENGINEERING.

Professors Porter and Lyle and Messrs. Miner, Goldbeck and Thoroughgood.

601. SURVEYING.—Chain, compass and transit surveying. Leveling, topographical drafting. Text-book—Breed and Hosmer's Plane Surveying. Third term, Freshman year. Two periods per week.
602. SUMMER SCHOOL.—Field problems in use of chain, level and transit. Survey of College Campus. Map. Area computations. Three weeks in vacation at end of Freshman year.
603. SURVEYING.—Trigonometric and barometric leveling. Use of plane-table, sextant and solar transit. Hydrographic surveying. Topographic drafting. Text-book—Breed and Hosmer's Higher Surveying. First term, Sophomore year. Two periods per week.
604. SURVEYING.—Trigonometric and barometric leveling. Use of plane-table, sextant and solar transit. Topographic drafting.

Text-book—Breed and Hosmer's Higher Surveying. First term, Junior year. Two periods per week.

611. RAILROADS.—Simple, reverse, compound, vertical and transition curves. Drafting. Text-book—Allen's Railroad Curves and Earthwork. Second term, Sophomore year. Two periods per week. Given to Mining Engineering students, first term, Junior year.
612. RAILROADS.—Turnouts, cross-overs. Paper location of railroad. Estimate of cost. Drafting. Field problems. Text-book—Allen's Railroad Curves and Earthwork. Third term, Sophomore year. Two periods per week.
613. SUMMER SCHOOL.—Railroad reconnaissance. Preliminary and final location. Cross-sectioning. Map. Three weeks in vacation at end of Sophomore year.
614. RAILROADS.—Computation of earthwork from notes of Summer School Survey. Problems in Earthwork. Mass diagrams. Drafting. Text-book—Allen's Railroad Curves and Earthwork. First term, Junior year. Three periods per week.
615. RAILROADS.—Economic location. Traffic. Operating expenses. Cars and locomotives. Virtual grades. Text-book—Wellington's Economic Theory of Railroad Location. Second term, Junior year. Two periods per week.
616. RAILROADS.—Transportation. Management. Design. Terminals, signals and railroad structures. Camp's Notes on Track. Third term, Junior year. Two periods per week.
622. APPLIED MECHANICS. STATICS.—Principles of equilibrium and their application to flexible cords, tackle, jointed structures, friction, moment of inertia. Kinematics. Rectilinear motion, curvilinear motion, harmonic motion. Motion of a rigid body, translation, rotation, plane motion. Text-book—Maurer's Mechanics. Third term, Sophomore year. Four periods per week.
623. APPLIED MECHANICS. KINETICS.—Motion of a particle, translation of a rigid body, rotation, plane motion of a rigid body, work and energy, impulse and momentum. First term, Junior year. Four periods per week.
624. MECHANICS OF MATERIALS.—RECITATIONS. The principles of stress and strain; the behavior of materials under tension,

compression and shearing; investigation and design of pipes, riveted joints, boilers and standpipes; strength and flexure of simple and cantilever beams. Report on the carrying capacity of a floor. Text-book—Merriman's *Mechanics of Materials*. LABORATORY. Study and use of testing machines. Commercial tension tests of iron and steel. Modulus of elasticity in tension and compression and shear tests of iron, steel and wood. First term, Junior year. Four periods per week.

625. MECHANICS OF MATERIALS.—RECITATIONS. Restrained and continuous beams; columns; shafts; reinforced concrete. Impact and fatigue; true and internal stresses; mathematical theory of elasticity. Design of an I-beam highway bridge and of a steel standpipe. Text-book—Merriman's *Mechanics of Materials*. LABORATORY. Transverse tests of cast iron and wood; modulus of elasticity of steel in bending; tests of wooden columns; torsion tests of iron and steel; calibration of testing machines; modulus of elasticity of concrete; reinforced concrete beams. Second term, Junior year. Four periods per week.

627. MECHANICS OF MATERIALS.—RECITATIONS. The principles of stress and strain; the behavior of materials under tension, compression and shearing; investigation and design of pipes, riveted joints, boilers and standpipes; strength and flexure of simple and cantilever beams. Report on the carrying capacity of a floor. Text-book—Merriman's *Mechanics of Materials*. LABORATORY. Study and use of testing machines. Commercial tension tests of iron and steel. Modulus of elasticity in tension and compression; and shear tests of iron, steel and wood. Second term, Junior year. Three periods per week.

628. MECHANICS OF MATERIALS.—RECITATIONS. Restrained and continuous beams; columns; shafts; reinforced concrete. Text-book—Merriman's *Mechanics of Materials*. LABORATORY. Transverse tests of cast iron and wood; modulus of elasticity of steel in bending; tests of wooden columns; torsion tests of iron and steel; calibration of testing machines. Third term, Junior year. Three periods per week.

631. **ROADS AND PAVEMENTS.—RECITATIONS.** Reconnaissance location, construction and maintenance of town and country roads, city streets and pavements, together with the methods of street cleaning. Text-book—Baker's Roads and Pavements. **LABORATORY.** Standard tests of paving brick and road metal. Second term, Junior year. Two periods per week.
641. **MASONRY.—**The requisites of stone, brick and cement; the different kinds of bonds; strength of stone, brick and concrete masonry; the construction of foundations, bridge piers, abutments, retaining walls, dams, culverts and arches. Text-book—Baker's Masonry. Third term, Junior year. Two periods per week.
642. **MASONRY DESIGN.—**Design of a dam, an arch and a culvert, using both graphical and numerical processes. Notes. First term, Senior year. Two periods per week.
651. **CEMENT.—RECITATIONS.** The study of raw materials; method of manufacture; meaning and interpretation of different physical tests; the sources of error in testing; the inspection and sampling of both Portland and Natural cements. Visits to cement mills and sampling and testing of a shipment of cement. **LABORATORY.** Tests of Portland and Natural cements are made in accordance with standard methods and specifications, the aim being to have the student become thoroughly acquainted with each standard test and understand and appreciate the significance of the results obtained. Special tests are made to show the effect of varying from standard methods. Text-book—Taylor's Practical Cement Testing. Laboratory Notes. First Term, Junior year. Two periods per week.
652. **CONCRETE.—RECITATIONS.** Materials for concrete; proportioning and mixing; strength of plain concrete in compression, tension and flexure; the expansion and contraction of concrete; fire resistance of concrete; action of salt water on concrete; concrete as a protection to metal; adhesion of concrete to steel and iron; a short discussion of the different systems of reinforcing. **LABORATORY.** The following work is required in the Concrete Laboratory: mechanical analyses of the

materials for concrete; proportioning and mixing; preparation of concrete specimens for future tests. Second term, Junior year. Two periods per week.

653. **REINFORCED CONCRETE.—RECITATIONS AND LECTURES.** Properties of the materials, general theory, relation of stress intensities in concrete and steel. Varieties of flexure formulas. Shearing stresses, bond stresses, working stresses and construction details. The preparation and use of diagrams and tables. The complete design for a reinforced concrete floor. Laboratory Tests on plain concrete specimens to determine the stress deformation curve in tension and compression. Modulus of elasticity. Tests on reinforced beams to determine deflection and fiber stress distribution, location of neutral axis, and comparison of actual results with those given by various formulas. Text-book—Taylor and Thompson. Third term, Junior year. Two periods per week.
661. **HYDRAULICS.—RECITATIONS.** Hydrostatics, hydraulic instruments, orifices, weirs and tubes. Text-book—Merriman's Hydraulics. **LABORATORY.** Tests are made on the circular orifice, the Venturi meter, water meters and weirs. Third term, Junior year. Three periods per week.
662. **HYDRAULICS.—RECITATIONS.** Pipes; conduits; rivers; water power; dynamics; overshot, undershot and breast wheels; impulse wheels; turbines. Text-book—Merriman's Hydraulics. **LABORATORY.** Tests are made on the impulse wheel and the turbine. **FIELD PRACTICE.** Measurements of the flow of the Lehigh River in accordance with the method used by the United States Geological Survey Notes. First term, Senior year. Three periods per week.
663. **HYDRAULICS.—RECITATIONS.** Pipes; conduits; rivers; water-power; dynamics; overshot, undershot and breast wheels; impulse wheels; turbines. Text-book—Merriman's Hydraulics. Laboratory tests are made on the impulse wheel and the turbine. First term, Senior year. Three periods per week.
671. **SEWERAGE.—**The disposal of sewage and garbage. The determination of the size and capacity of sewers, inlets and flush tanks. Construction methods. Text-book—Folwell's Sewerage. First term, Senior year. Two periods per week.

672. SEWERAGE DESIGN.—Design of a sewer system for a small city with map and profiles. Notes. Second term, Senior year. Two periods per week.
681. WATER SUPPLY.—The requisites for a good water; the available sources of supply; the construction of pumping plants, reservoirs and pipe lines; purification of water and its distribution to the public. Text-book—Turneure and Russell's Public Water Supplies. Second term, Senior year. Three periods per week.
682. WATER SUPPLY DESIGN.—Design of a water supply systems for a small city. Notes. Third term, Senior year. Two periods per week.
- 690. FRAMED STRUCTURES.—The theory and computation of stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Notes. Third term, Junior year. Two periods per week.
691. ROOFS AND BRIDGES.—The theory and computation of stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Railroad bridges under locomotive wheel, excess and equivalent loads. Stress sheets. Notes. First term, Senior year. Two periods per week.
692. ROOFS AND BRIDGES.—The theory and computation of stresses in continuous, partially continuous, draw and cantilever trusses. Notes. Second term, Senior year. Two periods per week.
693. ROOFS AND BRIDGES.—The theory and computation of stresses in suspension bridges and three-hinged arches. Notes. Third term, Senior year. Three periods per week.
694. ROOF DESIGN.—Complete computations and design drawing for a wooden roof truss with bill of materials and cost sheet. Notes. First term, Senior year. One period per week.
695. BRIDGE DESIGN.—Complete computations and design drawing of a plate girder for railroad purposes, in accordance with standard specifications. Bill of materials, weights and estimate of cost. Notes. Second term, Senior year. Two periods per week.

696. BRIDGE DESIGN.—Complete computations and design drawing of a thorough pin-connected railroad bridge in accordance with standard specifications. Bill of materials, weights and estimate of cost. Notes. Third term, Senior year. Three periods per week.
697. BRIDGE ERECTION.—Designing of false work. Erection of a full-weight pin-connected truss bridge. Third term, Senior year. Two days.
698. GRAPHIC STATICS.—Analysis of stresses by the force and equilibrium polygons. Application of the equilibrium polygon to the discussion of beams and girders. Analysis of stresses in roof and bridge trusses. Notes. First term, Senior year. One period per week.
699. THESIS.—A thesis is required of every student as a condition of graduation, upon a subject appropriate to and approved by the Department. All laboratories and other apparatus belonging to the Department may be used for thesis purposes. Third term, Senior year. Two periods per week.

MINING ENGINEERING.

Professor Hall and Messrs. Marquard and Colliton.

701. MINE SURVEYING.—Instruments. Location of stations. Underground traversing. Different methods of connecting surface and underground surveys. Mapping. Corrections for top and side telescopes. Surveys of mineral lands and claims. Calculation of ore in sight. Problems in mine surveying. Second term, Junior year. Two periods per week.
711. PROSPECTING.—Physical character of deposits. Geological indications. Prospecting for placer vein and bedded deposits. Preliminary workings. Sampling. Examination and valuation of mining properties. Location of claims and application for patents. Placer and hydraulic mining. First term, Junior year. Two periods per week.
712. DEEP BORING.—Uses and location of bore holes. Rod percussion drilling. American system of rope drilling. Diamond drilling. Special methods: Davis Calyx drill, Mather and Platt's system, Kind's system, hydraulic boring, etc.

Survey of bore holes. Shaft sinking by boring. Third term, Junior year. One period per week.

713. **BLASTING AND QUARRYING.**—Explosives. Tools for boring blast holes, particularly machine rock drills. Determination of size of blast hole and amount of charge. Location of bore holes. Firing, especially by electricity. Slate quarrying. Quarrying of building material. Open mine workings. Third term, Junior year. Two periods per week.

714. **SHAFT SINKING, DRIFTING AND TUNNELING.**—Excavations. Support of excavations by timber, metal, cement and masonry. Mode of approach and location of opening. Sinking through strata of different kinds. Gangway driving. Special sinking methods; piling, drums, freezing process, Triger's method, Kind-Chandron system, Lippman's system. First term, Senior year. Two periods per week.

715. **EXPLOITATION.**—Different systems of coal and metal mining on the surface and underground. Mining machinery. Comparison of methods of development. First term, Senior year. Two periods per week.

716. **TRANSPORTATION.**—Underground haulage; motors, road-bed, and cars. Rope haulage. Self-acting planes. Surface haulage. Hoisting; motors, ropes, brakes, drums, guides, cages and attachments. Safety appliances. Head frames. Loading and unloading. Signaling. Stocking and storing of ores. Second term, Senior year. Two periods per week.

717. **VENTILATION AND LIGHTING.**—Atmosphere of mines. Testing the air. Explosions. Natural ventilation. Furnace ventilation. Mechanical ventilation. Instruments for measuring the resistance of airways. Mine fires. Laws. Lighting; different methods. Safety lamps. Electric lighting. Laws. Second term, Senior year. Two periods per week.

718. **MINE DRAINAGE.**—Mine pumps. Water column pipes. Dumps. Dams. Hoisting water. Drainage tunnels. Siphons. Erection and care of pumping machinery. Third term, Senior year. Three periods per week.

719. **MINE CONSTRUCTION.**—Graphical and analytical methods

for finding stresses. Building materials. Framed structures. First term, Senior year. Three periods per week.

720. ORE DRESSING.—Principles involved. Rock crushers, rolls and stamps. Ore feeders. Classifying machinery. Concentrating machinery; jigs, bridles, tubs, tables and vanners. Magnetic concentration. Amalgamation. Concentrating mills. Third term, Senior year. Four periods per week.
721. ELECTIVE IN MINING.—Problems in mining. Designs for and Reviews of special mining operations. First term, Senior year. Two periods per week.
722. ELECTIVE IN MINING.—Second term, Senior year. Two periods per week.
732. ELECTRIC MINE MACHINERY.—Wiring mines. Lighting workings. Electric signaling. Electric coal cutters, locomotives, drills, hoists and pumps. Electric blast firing. Electric machinery compared with machinery operated by compressed air and steam. Problems. Third term, Senior year. Two periods per week.
741. MINE ADMINISTRATION.—Mine accounts and book-keeping. Organization and management. Employment of labor. Third term, Senior year. Two periods per week.
751. MINING LAW.—Mining laws of the United States. Contracts. Examination and reports. Accidents. Second term, Senior year. Two periods per week.
752. MINE CONSTRUCTION.—Masonry, foundations, retaining walls, etc. Second and Third terms, Senior year. Two periods per week.
753. Trestles, head frames, bridge and roof trusses, on bins, tipples, etc. Third term, Senior year. Two periods per week.
761. THESIS.—A graduation thesis is required of each student who completes the course. This must be an original design or review of some process, machinery or plant related to mining operations. The subject of the thesis is assigned by the department and the thesis must demonstrate the ability of the student to pursue his chosen profession.

ELECTRICAL ENGINEERING.

Professor Rood.

- 801.** ELEMENTS OF ELECTRICAL ENGINEERING.—Ohm's law; laws of resistance; Joule's law; electrolysis; magnetic principles; hysteresis; electrical measuring instruments, storage cells; electrical illuminants; underground and aerial conductors; elementary dynamo construction. First term, Junior year. Five periods per week.
- 802.** ELEMENTS OF ELECTRICAL ENGINEERING.—A continuation of 801. Dynamo magnetic circuit; field and armature windings; characteristic curves; parallel working; boosters; starters and controllers. Second term, Junior year. Four periods per week.
- 803.** ELEMENTS OF ELECTRICAL ENGINEERING.—A continuation of 802. Theories of electrical design; selection, purchase and maintenance of direct current apparatus and its systems of control. Third term, Junior year. Five periods per week.
- 804.** ELEMENTS OF ELECTRICAL ENGINEERING.—A special course designed for students in Civil and Mining Engineering. Electricity and magnetism; electrical measurements; electrical illuminants; lighting systems; dynamos; motors; alternating current machinery; transformers. First term, Junior year. Two periods per week.
- 805.** ELEMENTS OF ELECTRICAL ENGINEERING.—A continuation of 804. Installation and operation of electrical machinery; transmission systems, alternating current and direct; meters; switchboards; special applications of electricity to mining and civil engineering work. Second term, Junior year. Two periods per week.
- 811.** ALTERNATING CURRENTS.—Fundamental principles governing circuits having a variable E. M. F.; effect of resistance, inductance and capacity; generalized Ohm's law. First term, Junior year. Two periods per week.
- 812.** ALTERNATING CURRENTS.—A continuation of 811. Alternator regulation; single, two- and three-phase circuits; measurement of power in polyphase circuits; theory of the transformer;

single and polyphase transformers; methods of phase transformation. Second term, Junior year. Two periods per week.

813. ALTERNATING CURRENTS.—A continuation of 813. Polyphase power transmission; line losses; selection of line; induction motors; the rotary converter; special type of A. C. machines. Third term, Junior year. Two periods per week.

814. ALTERNATING CURRENT CIRCUITS.—An advanced consideration of alternating current circuits; Fourier's series and its application to A. C. circuits; wave form; wave and vector discussion and analysis; application and use of the complex notation. First term, Senior year. Three periods per week.

815. ALTERNATING CURRENT MOTORS.—An advanced consideration of single and polyphase, induction, synchronous and repulsion, alternating current motors, their analysis, construction, applications and tests. Second term, Senior year. Two periods per week.

821. ELECTRICAL LABORATORY.—Introduction to laboratory methods and practice; measurement of resistances by drop method; insulation test; magnetic leakage; fuses; voltmeter and ammeter calibration by various methods; recording meters. First term, Junior year. Two periods per week, reports.

822. ELECTRICAL LABORATORY.—A continuation of 821. Tests upon arc and incandescent lamps; photometry; magnetization and characteristic curves of dynamos; tests of armature reactions. Second term, Junior year. Two periods per week, reports.

823. ELECTRICAL LABORATORY.—A continuation of 822. Parallel running of generators; investigation of commutator losses; elementary tests with alternating currents; effects of inductance and capacity. Third term, Junior year. Two periods per week, reports.

824. ELECTRICAL LABORATORY.—Motor and dynamo characteristics, A. C. wave form; magnetization and characteristic curves of alternating current generators; efficiency and regulation tests of transformers. First term, Senior year. Two periods per week, reports.

825. ELECTRICAL LABORATORY.—A continuation of 824. Tests of induction and synchronous motors; transformer groupings and resultant ratios; phase transformation; power transmission; transmission losses and efficiencies. Second term, Senior year. Two periods per week, reports.
826. ELECTRICAL LABORATORY.—A continuation of 825. Motor-generator tests; investigation of the rotary converter and its losses and characteristics; dielectric strength of insulating materials; resonance; the oscillograph. Third term, Senior year. Two periods per week, reports.
831. THERMODYNAMICS.—The fundamental principles of thermodynamics; the steam engine; the steam turbine; pumps; steam boilers; the gas engine; the gas turbine; hot-air engines; refrigeration; refrigeration systems; fuels and fuel consumption; fuel test methods. Second term, Junior year. Required of all engineers. Four periods per week.
832. ELECTRIC POWER STATIONS.—Requires 831. A study of the considerations affecting the selection, erection and maintenance of steam hydraulic and electric machinery, and the assembling of such machinery to form an economical plant for the production of electric power and light. Second term, Senior year. Four periods per week.
841. ELECTRIC POWER TRANSMISSION.—Low potential direct and alternating current distributing systems; calculation of losses and drop; house and factory wiring and systems: fire hazards and their prevention; high potential lines, their construction and maintenance; lines and line losses. First term, Senior year. Three periods per week.
842. ELECTRIC RAILROADS.—Systems of distribution; rail-bonds and bond testing; electrolysis; direct current motors and controllers; single-phase commutator motors; train operation and control; speed-time curves. Third term, Senior year. Four periods per week.
851. ELECTRICAL DESIGN.—The design and calculation of rheostats, controllers, wiring systems and machines. First term, Senior year. Two periods per week.
852. ELECTRICAL DESIGN.—A continuation of 851. Design and

calculation of advanced types of electrical machinery, generators, motors and transformers. Second term, Senior year. Two periods per week.

861. ENGINEERING ABSTRACTS.—The review and discussion of articles and papers of value in current engineering literature. First term, Senior year. One period per week.
862. ENGINEERING ABSTRACTS.—A continuation of 861. More advanced literature. Second term, Senior year. One period per week.
863. ENGINEERING ABSTRACTS.—A continuation of 862. More advanced literature. Third term, Senior year. One period per week.
871. THE TELEPHONE.—A study of all the modern telephone systems with a review of the earlier systems and development. Third term, Senior year. Three periods per week.
881. ILLUMINATING ENGINEERING.—A review and close study of the modern types of illuminants, gas and electric; photometry and standards of light; candle power distribution; effective illumination; reflectors, shades and globes, their effects and losses; location of lights; wall reflection and absorption. Third term, Senior year. Three periods per week.
891. THESIS.—A thesis is required of every student as a condition for graduation, the topic assigned or approved by the head of the Department. The thesis must show the result of individual investigation and research.

CHEMISTRY AND METALLURGY.

Professors Hart and Wysor and Messrs. DeLong, Hess and Ross.

901. ELEMENTARY DESCRIPTIVE INORGANIC CHEMISTRY.—Brief course in the chemistry of the non-metals and metals comprising lectures, preparatory work, and recitations. Third term, Sophomore year. Two periods per week.
- 902-3-4. QUALITATIVE ANALYSIS AND QUANTITATIVE ANALYSIS BEGUN.—First, second and third terms, Junior year or Senior year. Two periods per week.

- 905-6-7.—QUANTITATIVE ANALYSIS.—Elective Course: The work of which is varied to meet the requirements of the student. First, second and third terms, Senior year. Two periods per week.
911. DESCRIPTIVE INORGANIC CHEMISTRY.—Lectures, quizzes and laboratory work. First term, Freshman year. Four periods per week.
912. ADVANCED INORGANIC CHEMISTRY.—The laws of gases. The chemical balance. Diffusion and dissociation. Principles of quantitative analysis. Recitations and laboratory work. Second term, Freshman year. Two periods per week.
913. QUALITATIVE ANALYSIS (Begun).—Third term, Freshman year. Four periods per week.
914. QUALITATIVE ANALYSIS (Continued).—First term, Sophomore year. Four periods per week.
915. QUALITATIVE ANALYSIS (Completed).—Second term, Sophomore year. Four periods per week.
916. QUANTITATIVE ANALYSIS (Begun).—Third term, Sophomore year. Four periods per week.
917. CHEMICAL ARITHMETIC.—Third term, Sophomore year. Four periods per week.
918. QUANTITATIVE ANALYSIS (Continued).—First term, Junior year. Six periods per week.
919. THEORETICAL CHEMISTRY including special determinations in the laboratory.—First term, Junior year. Two periods per week.
920. ORGANIC CHEMISTRY (Begun).—First term, Junior year, Two periods per week.
921. ORGANIC CHEMISTRY (Continued).—Lectures, recitations and laboratory work. Second term, Junior year. Four periods per week.
922. ORGANIC CHEMISTRY (Completed).—Third term, Junior year. Four hours per week.
924. THEORETICAL CHEMISTRY (Continued).—Second term, Junior year. Two periods per week.

925. THEORETICAL CHEMISTRY (Completed). Third term, Junior year. Two periods per week.
926. QUALITATIVE ANALYSIS (Begun) (Shorter Course). Second term, Freshman year. Two periods per week.
927. QUALITATIVE ANALYSIS (Completed) (Shorter Course).—Third term, Freshman year. Two periods per week.
928. QUANTITATIVE ANALYSIS (Begun) (Shorter Course).—First term, Sophomore year. Two periods per week.
929. QUANTITATIVE ANALYSIS (Continued) (Shorter Course).—Second term, Sophomore year. Two periods per week.
930. QUANTITATIVE ANALYSIS (Completed) (Shorter Course).—Third term, Sophomore year. Two periods per week.
931. QUANTITATIVE ANALYSIS (Continued).—Second term, Junior year. Four periods per week.
932. QUANTITATIVE ANALYSIS (Continued).—Third term, Junior year. Four periods per week.
933. QUANTITATIVE ANALYSIS (Continued).—First term, Senior year. Ten periods per week.
934. CHEMICAL TECHNOLOGY.—Manufacture of "heavy chemicals." First term, Senior year. Two periods per week.
935. CHEMICAL TECHNOLOGY (Continued).—Second term, Senior year. Two periods per week.
951. METALLURGY.—Properties of Metals. Refractory materials and fluxes; furnaces; fuels and thermo measurements; ore dressing; iron and steel. First term, Junior year. Two periods per week.
952. METALLURGY.—Lectures, recitation and laboratory. Second term, Junior year. Two periods per week.
953. METALLURGICAL CHEMISTRY.—Elective. First term, Senior year. Two periods per week.
954. METALLURGICAL CHEMISTRY (Continued).—Elective. Second term, Senior year. Two periods per week.
955. ASSAYING.—Second term, Senior year. Two periods per week.
- 961-2-3. TECHNICAL GERMAN.—Translation of Chemical works from the German. First, second and third terms, Junior year. One period per week.

- 964-5-6. TECHNICAL GERMAN (Continued).—First, second and third terms, Senior year. One period per week.
971. THESIS WORK.—Second term, Senior year. Six periods per week.
972. THESIS WORK (Completed).—Third term, Senior year. Twelve periods per week.

GENERAL INFORMATION.

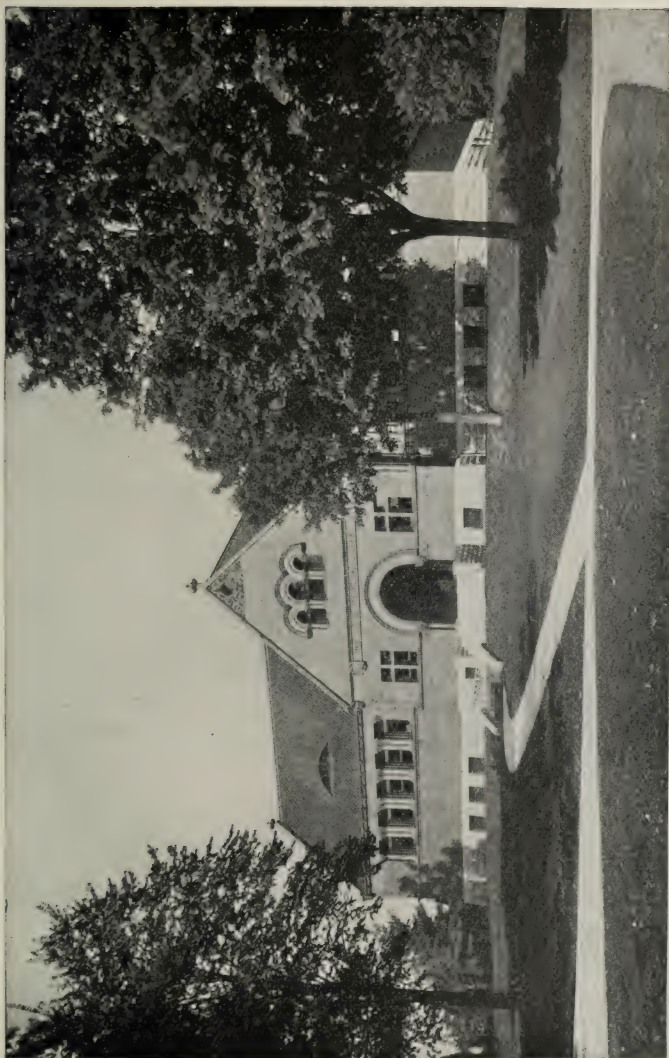
ATTENDANCE.

Attendance on all college exercises is strictly required. Absences on account of sickness, or for other satisfactory cause, may be excused, and leave of absence will be granted at the request of parents when absolutely necessary. In such cases the absence is excused, but the student is invariably required to make up such work as he may lose by reason of his absence. Reports are sent to parents whenever the absences of their sons exceed a reasonable number. In case of the absences becoming excessive, the faculty will punish the neglect with suspension. Absences incurred at the beginning and end of terms, especially if they involve absence from examinations, and immediately preceding and succeeding holidays, are regarded with special disapproval, and under ordinary circumstances will not be excused.

Each student is expected to have sixteen recitations each week. Three hours of field or laboratory work are regarded as equivalent to one recitation period. The regular gymnasium drills are also regarded as required exercises as far as prescribed. No student is permitted to take a course involving fewer hours of recitation without a special vote of the Faculty.

EXAMINATIONS.

Examinations are held at the close of each term on the studies of that term, and may be either written or oral, or both, at the option of the professor in charge.



VAN WICKLE MEMORIAL LIBRARY.

In addition to these regular examinations, partial examinations and written recitations are held from time to time during the term, with or without notice to the students. Failure to attend an examination, except for reasons of absolute necessity, is regarded as a serious delinquency, and will be dealt with according to the circumstances of each case.

STANDING.

The scholarship of students is determined by the results of the examinations and daily recitations combined.

Students entering with conditions are required to make them up before the end of the term next after that in which they enter.

Students failing to pass in any studies of any term are required to make up such studies before the end of the next term, and they may be specially directed to do so at an earlier date. Students who do not comply with these regulations will be put on probation in scholarship, or lose standing and be only "permitted to recite," or be dropped into the next lower class, as the Faculty may in each case, decide.

Reports of the standing of the students are made to their parents or guardians at the end of each term.

RULES GOVERNING ABSENCES AND RE-EXAMINATIONS.

1. No absence from a recitation, a lecture, or a laboratory exercise shall be excused.

2. If the number of a student's absences in any term from the exercises in any subject exceed the number of exercises per week in the subject, but not double the number, he may, at the discretion of the instructor in charge, be debarred from the term examination in the subject, provided the number of absences is not less than three.

If he be debarred, he must pass on the subject before the first day of the next term or repeat the subject with a following class.

3. If the number of a student's absences in any term from any subject exceed double the number of exercises per week in the subject, he must repeat the subject with a following class, provided that the number of such absences must exceed three.

4. If, for special reasons, the head of the department recommend it, the faculty may vote that a student who would otherwise be required to repeat a subject by Rule 3 be given one examination on the subject. If he fail in this examination, he must repeat the subject.

5. Before a student may take the examination provided for in Rule 4, he shall be required to pay to the treasurer of the college a fee of two dollars and show the treasurer's receipt for the same to the teacher in charge of the examination.

6. The instructor in charge of each subject shall, at the beginning of each week, post in some place easily accessible to the students interested, the number of absences from the exercises of the subject of each student to date.

7. All absences shall be reported weekly to the clerk of the faculty, who shall record them.

8. When the number of a student's unexcused and unpermitted absences from the religious and other exercises of the college reaches five, he shall be warned by his class dean; when it reaches ten, he shall be again warned; when it reaches fifteen, he and his parents shall be warned that he is in danger of being dropped from the college rolls; when it reaches twenty, he shall be dropped.

PERMITTED ABSENCES.

9. In case of absence due to prolonged sickness or request from home for urgent reasons approved by the dean, the student shall, as soon after the absence as possible, present to the dean a written statement of the cause of his absence, after which the dean shall give the student an exact statement of the duration of his absence, which he shall present to his instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then take it to the dean, and the absences indorsed upon it shall not be counted by the clerk in making up the number of Rule 8.

When such permitted absence causes the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done by the class during as many of these absences as are required to bring his absences below the debarring number by an examination to be held within a month of the absences.

If he fail in this examination, he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before this special examination may be held, the student shall pay to the treasurer of the college a fee of two dollars, and shall show his receipt for the same to the instructor in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

10. When permission to be absent from town has been given to a student by vote of the faculty or by the president acting for the faculty, such student shall receive from the dean an exact statement of the duration of such absence, which he shall present to his instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then return it to the dean and the absences indorsed upon it shall not be counted by the clerk in making up the numbers of Rule 8.

When such permitted absences shall cause the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done during as many of these absences as are necessary to bring his absences below the debarring number by an examination held within a month of the absence.

If he fail in this examination he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before this special examination may be held, the student shall

pay to the treasurer of the college a fee of two dollars and shall show his receipt for the same to the instructor in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

11. If professors, in whose departments a student has the majority of his hours per week, report to the faculty that the student is neglecting his work, he and his parents shall be warned that he is in danger of being dropped from the college rolls. If a second such report be made, he shall be dropped.

RE-EXAMINATIONS

1. A student who fails at the regular term examination, in any subject, shall be entitled to one re-examination.

2. If, for special reasons, the head of the department recommend it, the faculty may vote that a student who has failed in the re-examination provided for in Rule 1 may be given a second re-examination.

3. Before a student can take the second re-examination provided for in Rule 2, he shall be required to pay to the treasurer of the college a fee of two dollars and show the treasurer's receipt for the same to the instructor in charge of the examination.

4. If, at the beginning of the college year, a student has failed to pass on his conditions of the preceding year in the departments of Mathematics, Mechanics, Physics, French and German, he shall be required to repeat the subjects in which he is still conditioned.

5. When subjects, which closely depend upon each other, are continued through successive terms, the department interested may require that all conditions of any term in those subjects shall be made up within two weeks from the beginning of the next term, in order that the student may go on with those subjects.

6. All students who have one or more conditions in Freshman English at the end of the third term are required to take English with the incoming Freshman class and to remain in the course till they have satisfactorily passed off their condition or conditions. No re-examinations are given in the course.

7. A student who fails in mathematics in any term of the Freshman year or in the first term of the Sophomore year shall report

for re-examination at nine o'clock of the day preceding the first day of the next term and if he fail to make up his condition he shall take an extra class of two hours per week for one term in the subject in which he failed, said class to rank as a regular part of his schedule of study.

GRADUATION.

Students who have pursued the entire course as prescribed and have successfully passed their examinations are recommended to the trustees for the first academic degree in course. Such recommendations are ordinarily acted upon and the degrees are conferred at Commencement, at which time the students receive diplomas from the President of the College. At Commencement the faculty awards such honors as it sees fit to those who are to receive degrees. These honors ordinarily consist of a valedictory oration, a Latin salutatory, and other honorary orations and theses.

COMMENCEMENT.

The College year is so arranged as to provide a term of 14 weeks immediately before the Wednesday preceding Christmas day and two terms of 11 weeks each after the Christmas vacation, the vacation at Christmas and in the Spring being two weeks each. The annual Commencement usually falls on the third Wednesday in June but occasionally the fourth Wednesday. In the year 1910, Commencement will fall on the fourth Wednesday. The three days immediately preceding Commencement day are set apart for special exercises. On Sunday, the first of these days, a Baccalaureate sermon is preached in the College chapel at eleven o'clock in the morning; and in the evening a sermon is preached in the auditorium of Pardee Hall before the Brainerd So-

ciety of the College by some distinguished minister selected by the Society.

The preacher for 1909 was Rev. Isaac J. Lansing, D.D., of Scranton.

On Monday the Senior class holds its Class Day exercises on the campus.

The alumni and literary societies hold their reunions on Tuesday, and orations are delivered before the literary societies in the Society halls.

The regular Commencement exercises are held in the auditorium of Pardee Hall on Wednesday morning, the afternoon being occupied by the alumni dinner. All these exercises are open to the public. Various other exercises of an athletic or social nature are conducted on the part of the students under a general supervision by the faculty.

DEGREES.

THE FIRST DEGREE.—The degree of *Bachelor of Arts* is conferred on the graduates of the Classical Course; *Bachelor of Philosophy*, on those of the Latin Scientific Course; *Bachelor of Science*, on those of the General Scientific Course; *Bachelor of Science* (in Chemistry), on those of the Chemical Course; *Civil Engineer*, on those of the Civil Engineering Course; *Engineer of Mines*, on those of the Mining Engineering Course; *Electrical Engineer*, on those of the Electrical Engineering Course.

MASTER'S DEGREE.

MASTER OF ARTS.—The degree of *Master of Arts* may be conferred one year after graduation on any *Bachelor of Arts* who has pursued a prescribed course of study, equivalent to sixteen recitations per week, during one year in residence, passed the examinations, and presented a satisfactory thesis.

The same degree may be conferred two years after graduation on any *Bachelor of Arts* who shall have devoted at least one year exclusively to advanced study under the direction of the faculty,

passed examinations in the studies pursued, and presented a satisfactory thesis.

Candidates for this degree must in all cases register on or before October 1st, and examinations must be held at the college at least once in each college term. Theses must be presented for approval not later than May 1st. A registration fee of \$5 and tuition fee of \$100 per annum for residents, and \$45 per annum for non-residents, is exacted of all graduate students.

MASTER OF SCIENCE.—The degree of *Master of Science* may be conferred upon any graduate of the scientific department upon conditions similar to those prescribed for the degree of Master of Arts.

DOCTOR OF PHILOSOPHY AND OF LETTERS.

The degree of *Doctor of Philosophy* may be conferred three years after graduation on any college graduate who, during three years of continuous residence at the college, shall have devoted himself exclusively to advanced studies under the direction of the faculty, passed examinations in them, and presented a satisfactory thesis. The candidate must designate three branches of study which he desires to pursue, each in a different department, one major or principal study, and two minor studies. The faculty will recommend for this degree men of high capacity and attainments only. Length of residence or time spent in study constitute no claim for its bestowal.

The regulations governing registration, examination, theses, and fees are the same as for the Master's degree.

Any graduate of a recognized college may be permitted to pursue graduate studies under the direction of the professors in the various departments upon satisfactory evidence of his fitness to do so. No curriculum is prescribed for such students. A course of study is usually arranged after consultation which will meet the specific object each student has in view.

CERTIFICATES.

Students who have been admitted to any department of the college, and have passed satisfactory examinations therein, may obtain certificates of the work which

they have done if they have been in attendance not less than one year.

RELIGIOUS INSTRUCTION.

The aim of Lafayette College is distinctly religious. Under the general direction of the Synod of Pennsylvania of the Presbyterian Church its instruction is in full sympathy with the doctrines of that body. At the same time religious instruction is carried on with a view to a broad and general development of Christian manhood within the lines of general acceptance among evangelical Christians, the points of agreement, rather than those of disagreement, being dwelt upon.

Prayers are held each morning in the chapel at 7:50 and religious services in the chapel Sunday mornings at 11 o'clock. All students are expected to attend these services. No exceptions will be made to this rule for morning prayers. Where there is some exceptional reason assigned by the parents, students will be permitted to attend one of the churches in Easton instead of the Sunday morning service. This permission will be granted only on request of parents and for sufficient reason.

Special sermons are preached before the college from time to time by distinguished ministers. The preachers for 1909 were: Rev. Robert H. Nassau, D.D., Trenton, N. J.; Rev. Charles R. Erdman, Princeton, N. J.; Rev. Joseph W. Cochran, D.D., Philadelphia, Pa.; Rev. Edward G. Fullerton, D.D., Wilkes-Barre, Pa.; Rev. Frederick W. Loetscher, Ph.D., Philadelphia, Pa.; Rev. Ebenezer Flack, D.D., Scranton, Pa.; Rev. John McDowell, Newark, N. J.; Rev. William Porter Lee, German-

town, Pa.; Rev. John B. Rendall, D.D., Lincoln University, Pa.; Rev. William P. Fulton, D.D., Philadelphia, Pa.; Rev. John B. Rendall, Jr., Greensburg, Pa.; members of the faculty and the local clergy.

The preacher for the Day of Prayer for Colleges, 1910, is Rev. Griffin W. Bull, D.D., First Presbyterian Church, Scranton, Pa.

Instruction in the Bible has always held a prominent part in the College, and a full account of the courses in Bible study will be found on pages 82-84.

LECTURES.

Special courses of lectures are given annually in connection with several departments and will be found under those departments. A more general course of a popular character is given each year.

TERMS AND VACATIONS.

The College year is divided into three terms, with intervening vacations, as given in the Calendar on page 3. All the classes are examined at the close of each term, and a report sent to the parent or guardian. Students are required to be present punctually at the beginning of each term, and are not allowed during term-time to be absent from town, except by written permission from the Dean.

The Wednesday after the 20th of October in each year is observed as Founders' Day, in memory of those who founded the College and of those who have since contributed to its usefulness. On Founders' Day, 1909, an address was delivered by Benjamin F. Trueblood, LL.D., of Boston, Mass.

BUILDINGS, LABORATORIES, LIBRARIES.

The college grounds are situated upon the summit of a beautiful hill, overlooking the city of Easton. They are reached by a flight of stone steps, which ascend the bold front of the hill directly from the head of Third Street, or by electric cars, which skirt the face of the hill by a gradual incline. At the head of the steps stands the monument erected by the alumni association to their comrades who "died for the Union." The grounds contain about fifty acres terraced and laid out under the direction of Donald G. Mitchell. The buildings upon the campus are forty in number. The oldest of these is

SOUTH COLLEGE.

The central portion of this building was erected in 1883 and was the original college building. At later periods east and west wings were added and the whole building was thoroughly overhauled and modernized in 1909. It now contains a large part of the class and lecture rooms for the academic department, and the basement and first floor of the east wing have been fitted for a lecture room and laboratory for the Department of Mining Engineering.

The first and second floors of the west wing are occupied by the College Chapel. The remaining space in the main building and in the wings is devoted to dormitory rooms which have been thoroughly modernized, and every comfort afforded by modern plumbing and sanitary arrangements has been added.

The building has also been beautified by a portico on the south front and by many improvements in the general finish of the building.



SOUTH COLLEGE.

The alterations have been intended to secure every needed improvement without altering the general effect of the building. The sentimental value of its historical place in the college life and thought have not been lost sight of.

PARDEE HALL.

The most commanding position on the campus is occupied by this building, the most conspicuous evidence of the liberality of the late Ario Pardee, which reached to every department of the college. Here the department of civil, mining, and electrical engineering are supplied with thoroughly equipped laboratories and lecture-rooms, and the museums of these departments, and of general geology, mineralogy, and natural history, are to be found. The Ward Library and the handsome rooms of the two literary societies are also in this building, and the central portion of the second and third floors of the main building contains a beautiful auditorium, in which the Commencement exercises, lectures, and other public entertainments are held.

THE VAN WICKLE MEMORIAL LIBRARY.

The Van Wickle Library was dedicated on May 30, 1900. It has given to the College one of the most needed additions to its equipment. A beautiful building of Pompeian brick and terra cotta, thoroughly furnished with the most approved appliances for library work, it is at once a most beautiful and useful feature in the college's development. It contains a large reading room, in which the periodicals and books of most constant reference are to be found; a reference book department;

a large room for the general storage of the library; librarian's room; and small rooms for special work.

JENKS BIOLOGICAL HALL.

This building was erected in 1864-'65 by the late Barton H. Jenks, of Philadelphia. It was recently entirely remodeled.

THE GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY,

completed in 1902, is occupied by the departments of chemistry and metallurgy. The building consists of three stories, and is constructed of Indiana stone, colonial brick, and gray terra cotta. It is fireproof, with steel and cement floors, and gives a thoroughly modern equipment to these departments. This building contains also the Henry W. Oliver Chemical and Metallurgical Library.

THE ASTRONOMICAL OBSERVATORY,

in addition to the Observatory proper, contains a lecture-room, with accommodations for the students in astronomy.

WEST COLLEGE

contains the lecture-room of Dr. Francis A. March and the offices of the registrar and treasurer of the College.

GYMNASIUM.

The importance of physical culture was early recognized by this College and a gymnasium was erected in 1884 and placed under the direction of a competent instructor. At the present time regular drills are required of the Freshman and Sophomore classes four times a week.

Optional training in general gymnastics and fencing offered to upperclassmen, and the students are encouraged to participate in such outdoor sports as their physical development fits them for.

The gymnasium is equipped with all the apparatus requisite to physical training, with lockers, bath and dressing-rooms. Before taking part in the gymnasium exercises, or the outdoor sports every student is given a thorough examination, and great care is taken to give each student such exercises as he needs and to avoid anything that would be injurious. In addition to the Director, one of the most able and experienced physicians of Easton acts as consulting physician, and requests for special work or exception from any prescribed work are passed on by the Director and the Consulting Physician. No excuses from the required drills will be granted except upon the recommendation of these officials. A fine athletic field adjoins the campus. It is admirably equipped for athletic contests. Four recent classes erected a commodious field house on it. Here the contests in football, baseball, and track athletics, in which the students have excelled, are held.

No student may take part in any public contest without written permission from his parents previously filed with the Clerk of the Faculty.

THE DORMITORIES.

A complete reorganization of the dormitory system was effected in the summer of 1900 by the building of central structures, known as Knox and Fayerweather Halls, to connect Blair and Newkirk Halls and Martien and Powell Halls respectively, and the facing of the

completed buildings with mottled Pompeian brick, handsomely trimmed with red terra cotta. The architectural beauty of the buildings is in marked contrast with the former appearance of the separate buildings. A complete sanitary plumbing system of baths, sinks, closets, and electric lights has been installed in all the buildings. These improvements leave nothing to be desired for the health and comfort of the students.

INFIRMARY.

A building on the extreme northeast corner of the campus, facing upon McCartney Street, is set apart for the use of sick students, thus securing quiet and complete isolation in case of the occurrence of any contagious disease.

This building is intended solely for the use of students rooming in the College buildings.

BRAINERD HALL.

This building for the Y. M. C. A., the gift of J. Renwick Hogg, Esq., '78, of the Board of Trustees, was erected in 1902. It is a three-story gray stone building in the Tudor Gothic style. It contains a large room for the meetings of the society, and reading, writing, and committee rooms; also a trophy room for the athletic association, a room for the collection of curios from foreign missionary fields, and bowling-alleys in the basement.

Its object is to afford a home under active Christian influences for all forms of student life.

CENTRAL STEAM PLANT.

During the autumn of 1909 a central steam plant was established with a power house built of stone with a concrete roof containing large boiler and storage rooms with every convenience for the running of the plant. The power house is equipped with four 150 horse-power boilers which are sufficient for the present needs of the College and any probable additions for a considerable number of years to come. Provision is also made for the addition of an electric power plant whenever it shall be deemed desirable. This plant is now in full and successful operation and promises to be of great value to the College.

OTHER BUILDINGS.

The remaining buildings consist of a large GREENHOUSE, a useful adjunct to the department of botany, and also supplying flowers and plants for the adornment of the grounds in summer and of the buildings on public occasions. Besides these, a number of buildings are occupied as the HOMES OF THE MEMBERS OF THE FACULTY. The intimate relations resulting from the residence of both faculty and students upon the College grounds are regarded as one of the most wholesome features of the College life.

LIBRARIES AND READING-ROOM.

The main regular College Library occupies the Van Wickle Memorial Library, described above. The College Library was established at the foundation of the College, and has had a steady and uninterrupted growth since 1832, and is chiefly made up of books bearing directly on the courses of instruction. The Ward·Li-

brary, the gift of the heirs of C. L. Ward, Esq., of Towanda, is largely made up of books of general literature and history and Political Science. Each of the technical departments has also a collection of books, magazines, and other scientific publications in rooms in immediate connection with their lecture-rooms and laboratories. By the gift of \$5,000 Mr. Henry W. Oliver laid the foundation of the H. W. Oliver Chemical Library in the new Gayley Laboratory. The foundation has been added to by gifts from Prof. Edward Hart and others, and the incorporation of the College's collection of chemical works.

A friend of the College has bought and presented to the Henry W. Oliver Chemical and Metallurgical Library all the pamphlets, about three thousand in number, belonging to the library of the late Prof. Johannes Wislicenus, of the University of Leipsic.

The literary societies, also, have libraries numbering about 6,000 volumes, largely of a literary character, which valuably supplement the more solid libraries of the College.

The College Library contains a papyrus scroll, five feet long, from a mummy at Thebes, with a hieratic inscription—pronounced by Seyffarth the finest he has seen—presented by the late Hon. John Garrett, of Baltimore, of the class of '37, and a collection of prints and medals of General Lafayette presented by the late President William C. Cattell, D.D., LL.D.

There is also a full-length portrait of Lafayette, by Healey, presented by the late Dr. Thomas W. Evans, of Paris.

ALUMNI ALCOVE.—A collection of books and pam-

phlets written by the students, alumni, faculty and trustees of the College is being gathered and set apart as a "Lafayette Library" to represent the literary activities of the College. This unique and valuable collection now numbers about 400 volumes, and includes a full set of the College catalogues from 1832 to the present time, the Commencement addresses, and official publications of the College.

The LIBRARIES have received gifts, which are hereby gratefully acknowledged, from the following individuals and institutions:

Individuals:

Rev. Stephen G. Barnes, D.D. (1 pamphlet); James L. Barton; Herbert N. Cass; Rev. J. W. Cochran (2); Prof. S. J. Coffin; Prof. Alvin Davison; B. F. Fackenthall, Jr. (3); William Edgar Geil (80) Chinese books; Prof. James B. Hopkins (2); Mrs. B. A. Hrbek; Arthur L. Leshner (6); George Loveland (2); Mrs. J. W. Moore (529); Prof. W. B. Owen (3); Hon. Boies Penrose (4); Prof. George Lansing Raymond (9); John Ward Stimson; Fred E. Stockton (2); Prof. J. W. Tupper; W. C. Ross (4); Pres. E. D. Warfield; Mrs. Charles B. Warring.

Firms and Institutions:

American Baptist Publ. Society (6); Andover Theological Seminary; Board of Trustees. "Commissioners of Waterworks," Cincinnati, Ohio; Harvard University; Haverford College; Lake Forest University (2); Pennsylvania Society Sons of the Revolution; Presbyterian General Assembly (2); Princeton Theological Seminary; Society of the War of 1812; Standard Oil Co. (6); University of Pennsylvania; Western Theological Seminary; Royal Society of Canada; New Jersey State Geologist; New York State Education Department (2); New York State Board of Health (2); Massachusetts State Board of Health (3); Connecticut Bureau of Labor Statistics; Smithsonian Institution.

United States Departments:

Commissioner of Education.

The Class of 1871 has given to the College a fund, the proceeds

of which are to be used for the purchase of the publications of the Early English Text Society. The library now contains a large and valuable collection of these.

The class of 1875 at its reunion in 1905 by the gift of one thousand dollars established an alcove in the library to be known as "The Francis A. March Alcove."

The class of 1892 at its decennial reunion in 1902 established an alcove in the library devoted to American literature. Two hundred volumes have been purchased and additions will be made from time to time.

SCIENTIFIC COLLECTIONS.

These are extensive and valuable, and are rapidly increasing from year to year by gifts from societies and individual donors, and by special appropriations in addition to the fees for registration and matriculation.

Among the most valuable of the collections may be mentioned the extensive herbarium, collected by Prof Thomas C. Porter during forty years of enthusiastic labor; it is especially rich in North America plants and is believed to contain the most complete flora of Pennsylvania in existence and the series of Ward's celebrated casts, illustrating geology and palaeontology.

The apparatus in the department of physics and applied mechanics, the instruments used in the departments of astronomy and engineering, and the scientific equipment of the numerous and extensive laboratories, meet the demands of advanced instruction in these departments; a special feature, however, is the series of nine hundred wall charts, executed at the College by Gustave Garnier, under the direction of the professors in the departments of astronomy, chemistry, physics and applied mechanics, metallurgy, and natural history. There are valuable models in machine drawing, stone cutting, crystallography, and architecture.

COLLEGE SOCIETIES.

LITERARY SOCIETIES.

The *Washington* and *Franklin* societies were organized early in the history of the College and are conducted by the undergraduates. Both societies have

well-furnished apartments in Pardee Hall, and valuable libraries. They meet every Wednesday evening for literary exercises, consisting of orations, essays, and debates. A generous rivalry for College honors exists between them, and each year representatives of the two societies from the Junior class engage in a public contest in oratory. On the day before Commencement the societies hold reunion meetings in their halls. These societies are an important part of College life and work, and *all the students are strongly advised to join them.*

BRAINERD EVANGELICAL SOCIETY.

The *Brainerd Evangelical Society*, as a society of inquiry, meets each Thursday evening and on the first Friday of each month in the interest of missions, and for the promotion of Christian effort. Its public anniversary is held on Sabbath evening of Commencement week, at which time a sermon is preached usually by some former members of the Society. In 1909 the preacher was Rev. Isaac J. Lansing, D.D., Scranton, Pa.

BIOLOGICAL SOCIETY.

The *Biological Society* is for the purpose of making its members intelligent concerning the important biological questions of the day, enabling them to appreciate the value of research in nature. The membership consists of those students of the three upper classes who are either prospective or present members of the classes in biology, and of such graduate students as are interested in the laws of life comprehended through the natural history sciences.

CHEMICAL CLUB.

A *Chemical Club* has been organized by the stu-

dents, for reading and discussing papers contained in the current chemical magazines, and to listen to lectures from visiting chemists.

DEUTSCHER VEREIN.

This Society is organized to promote interest in the German language and literature. Meetings are held fortnightly. Lectures on German life and culture are given at each meeting.

CLASSICAL UNION.

The Classical Union is an association which aims to bring together the students of the culture courses and to promote the interests of classical study in the College. Lectures on important subjects are given from time to time by members of the faculty and by eminent scholars from other institutions.

EXPENSES.

The tuition is \$100 per annum in all departments. Sons of ministers of the Presbyterian Church and candidates for its ministry receive free tuition in the Classical Course, and are charged one-half tuition in the technical courses.

The other College charges are as follows:

General expenses.....	\$8.00 a term
Library and Reading-room.....	5.00 "
Gymnasium.....	2.00 "

The annual College charges are, therefore, for those who pay tuition in full, \$145.

Entrance Fees.—Each student pays \$5 when he is registered for examination on entering College, and \$10 when he is matriculated, thirty days afterwards. These

fees are appropriated in part to the increase of the scientific collections and apparatus. No fees are charged for diplomas.

Laboratories.—Apparatus for the use of students in the chemical laboratories will be furnished and charged to their account, and the charge canceled for that returned in good condition. Chemicals and all other materials will be charged according to the average cost. A deposit sufficient to meet these expenses is made on entering the laboratories. Members of the classical department are admitted to all the privileges of the laboratories while studying general chemistry, and, for the present, without charge for the aid of the professor in attendance; each student will, however, pay for chemicals which he uses, and for any apparatus which he may break or injure. In the physical laboratory a fixed charge of \$5 per term is made for supplies and the use of apparatus.

Scholarships.—The endowed scholarships providing free tuition in the Classical Course will hold good for the Latin Scientific Course, but students in the other courses of the Pardee Scientific Department are required to pay one-half of the regular tuition fee in addition to the scholarship.

Aid is also given to young men of ability and good moral character who are dependent on their own efforts for their education. The amount will depend on the necessities of the applicant, but in no case will exceed the amount of the tuition fees in the Classical and Latin Scientific Courses, or one-half the tuition fees in the other technical courses. Application for such aid should be made to the President. No aid is granted to students pursuing special or incomplete courses of study.

BOARD, ROOMS, WASHING.

In all cases the place of boarding must be approved by the Faculty. The price of table board in clubs managed by the students at present averages from \$3.75 to \$4.50 per week. Board, including furnished room, in private families, is from \$4.50 to \$6 per week. Washing costs 40 cents per dozen pieces.

Unfurnished rooms in the College buildings rent for \$7 to \$33 a term; unfurnished rooms adjacent to the College premises for \$12 to \$16 a term, or furnished rooms for \$15 to \$30 a term.

Students are expected to room in the College dormitories unless they receive permission to room elsewhere. If they do not occupy College rooms, they are subject to an assessment to meet the loss to the College for rooms left vacant. The reason for this rule is that the funds of the College have been invested in the dormitories in order to secure cheap and convenient lodgings for the students, and it is to the advantage of all that the buildings should be occupied, the income from the investment being essential to the work of the College, and the students being protected against exorbitant rents.

Information in regard to the selection of rooms can be had from Professor Lyle, inspector of College buildings, the buildings being open for inspection during each term, and three days preceding the first day of each term. Rooms are assigned only to students who have been admitted to College, or who present full certificates from authorized schools, in the order of their application.

The rules of the Board of Trustees require that all College bills shall be paid in advance. For the con-

venience of the students it is arranged that payments of the bills shall be made by the Seniors on the first Thursday of each term, by the Juniors on the first Friday, by the Sophomores on the first Saturday, and by the Freshmen on the first Monday. No student is regarded as regularly enrolled for any term until his bill is paid. He may be dropped from the roll for neglect of his bill at any time upon notice from the treasurer to the faculty.

Students entering after the middle of the term shall pay one-half of the College charges for the term. Students obliged, on account of sickness, to leave before the middle of the term may have refunded to them one-half of the College charges for the term; no reduction will be made to those leaving for any other cause.

Where it is impossible for a student to pay his bill on the day it is due, the Executive Committee has power to extend the payment of the bill for not more than thirty days, provided that a written request is filed with the treasurer *on the day the bill is due*, stating a satisfactory reason for the extension. A penalty of 10 per cent. will be added to every bill remaining unpaid after the expiration of thirty days, and no student whose bill is unpaid shall be permitted to take the term examinations. Those desiring the bill to be sent home must call at the treasurer's office during the first week of the term, acquaint themselves with the items of the bill, make the request that it be sent and give the address to which it is to be sent.

The care and regulation of the dormitories are under the direction and management of a Board of House Representatives, elected by the students. House rules are enacted and enforced by the board. The Parietal Committee, composed of the inspector of buildings and

officers of inspection who reside in the dormitories, acts as a court of appeal.

The steam-heated dormitories are lighted by electricity, the cost of which to each of the occupants is \$6 a year.

A deposit of \$1 is also made at the beginning of each term to pay for public damages, the unexpended balance of which is returned to the student at the end of the year.

Annual Expenses.—Some money for books and other incidental expenses will be needed, but, with close economy, the total annual expenses—exclusive of tuition, clothing, and traveling expenses—need not exceed \$288, as will be seen from the following summary:

	Liberal.	Moderate.	Minimum.
General college expenses.....	\$24 00	\$24 00	\$24 00
Charge for College, reading-rooms, gymnasiums, etc.....	21 00	21 00	21 00
Board, 36 weeks, at \$3.75 to \$4.50...	160 00	144 00	135 00
Rent of College-room, \$21 to \$99....	99 00	49 00	21 00
Light and fuel.....	18 00	15 00	12 00
Washing.....	25 00	16 00	9 00
Tuition.....	100 00	100 00	100 00
Books and stationery.....	38 00	21 00	16 00
	\$485 00	\$390 00	\$338 00
Deduct for sons of ministers, <i>et al.</i> , in Classical Course.....	.....	.....	100 00
			\$238 00
Deduct for same in other courses....	.....	.....	\$50 00
			\$288 00
Lowest charges for nec- } Classical... essary expenses..... } Technical..	.....	.....	\$238 00
			\$288 00

Laboratory fees and damage assessment, which vary in amount, must also be added, while the personal expenses for clothing, etc., must be estimated according to individual experience. The first year will be made more expensive by the fees for registration and matriculation, and furnishings for room; \$300 will therefore be a small allowance.

Parents and guardians at a distance may deposit funds with some member of the faculty, who will pay particular attention to the pecuniary concerns of the student, settling his bills, and transmitting an account of the expenditure, for which services he will charge a commission. It is strongly recommended that parents furnish their sons with little beyond what will meet their necessary expenses.

BEQUESTS AND DEVISES.

Each state has special statutory regulations in regard to wills, and it is most important that all testamentary papers be signed, witnessed, and executed in all other respects according to the laws of the state in which the testator resides. In all cases, however, the name of the corporation must be accurately given, as in the following forms:

I give, devise, and bequeath to "Lafayette College," in Easton, Pennsylvania, their successors and assigns forever, the sum ofdollars, to be invested by said corporation in good real estate security, and the interest accruing therefrom to be applied to the support of the Professors in said College.

I give, devise, and bequeath a certain lot situated, etc., to "Lafayette College," in Easton, Pennsylvania, and to their successors and assigns forever, for the uses and purposes of said College, according to the provisions of its charter.

PRIZES.

The following prizes are offered annually:

THE FRANCIS A. MARCH PRIZE IN ENGLISH.

A prize of thirty dollars in books was given from 1862 to 1881 by the late Rev. William C. Fowler, LL.D., of Durham, Connecticut, and since 1881 has been continued by Henry A. Potter, M.S., class of '77, of New York, under the title of "The Francis A. March Prize," upon the following conditions:

• "A committee of at least three shall be chosen by the faculty to determine which student of the Senior class has made the greatest proficiency in English philology.

"The decision of the committee is to be made after attending an examination in some English classic, conducted by the professor in English, and after reading essays written by the several members of the class, which shall contain a discussion of the language of some English classic."

The subject in 1910 will be the works of John Milton.

THE ASTRONOMICAL PRIZE.

A prize of thirty dollars in gold is awarded to the student making the greatest progress in the study of astronomy in the Senior year.

MATHEMATICAL PRIZES.

Two prizes of the value of twenty dollars each are offered in the department of mathematics to those students of the Junior class, one in the Classical and general courses of the scientific department, and one in the technical departments, who shall have exhibited during the first two years of the course the greatest proficiency in the study of mathematics.

These prizes were founded, as was the astronomical prize above mentioned, in 1867, by Professor Traill Green, M.D., LL.D.

THE LOUNSBURY PRIZE IN CHAUCER.

A prize, consisting of books, is given to that student of the Sophomore class who shall present the best essay upon some one of the works of Chaucer. This prize was given in 1896 by Thomas R. Lounsbury, professor of English at Yale University, and will be

continued by friends of the College as the Lounsbury prize in Chaucer.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE.

A prize, consisting of books of the Early English Text Society, of London, is given to that student of the Sophomore class who shall at the close of the Sophomore year pass the best examination in "English before Chaucer." The examination is based upon selected texts announced from year to year, which in 1910 will be from the New Testament.

This prize was founded in 1871.

THE CLASS OF '83 PRIZE.

A prize of the value of fifteen dollars is annually awarded to that member of the Sophomore class who shall have attained the highest standing in his division of the class in Trench on The Study of Words.

This prize was founded by the class of 1883 at their graduation.

COLEMAN BIBLICAL PRIZES.

Three prizes, each of the value of twenty dollars, are awarded to those students of the Freshman class who have attained the highest standing in the several divisions of Biblical study in that year.

These prizes were founded by the Rev. Lyman Coleman, D.D., in 1880.

PRIZES IN ORATORY.

The Washington and Franklin literary societies appropriate one hundred dollars a year for prizes in oratory. Four contestants are chosen from each Hall to take part in the Junior Oratorical Contest, which is held in May. In the presence of a public audience three judges, approved by the faculty, hear the speakers and award the prizes. Their decision is based on the merits of the performances as to originality and force, with reference both to composition and delivery. The first prize is fifty dollars, the second prize thirty dollars, and the third prize twenty dollars.

PRIZES IN DEBATE.

Three prizes, of the total value of fifty dollars, are awarded to

the successful competitors in a Senior contest in debate, held on Washington's birthday in each year, between three contestants from each of the literary societies, chosen by a competitive debate in each society prior to December 1st in the previous year. The amount of the prizes and the conditions of the award are similar to the Junior Oratorical Contest. The first of these contests was held in 1894. The subject for debate in 1910 is:

RESOLVED, "*That a realignment of the great political parties on questions of Social and individual welfare is demanded by the conditions of the day.*"

CIVIL ENGINEERING PRIZE.

A prize of the value of fifty dollars, the gift of Carroll Phillips Bassett, C.E., Ph.D., of the class of 1883, is annually awarded to that member of the graduating class who presents the best graduating thesis and attains the highest standard of scholarship in the Civil Engineering Course.

THE PARK PRIZE IN LATIN.

A prize of fifteen dollars for the Latin Department has recently been founded by Mr. Samuel R. Park, A.M., '84. In 1910 it will be awarded, on the work of the second and third terms Freshman class, for excellence in Horace.

HISTORICAL ESSAY PRIZE.

A prize consisting of a copy of his work, "*The Marquis de Lafayette in the American Revolution*," is given annually by Charlemagne Tower, Jr., LL.D., of Philadelphia, to that member of the Senior Class who shall, on or before the first day of October, present the best essay on some subject connected with the relations of *France and the United States*. The essays must not exceed three thousand words in length. The subject for the year 1910 is: "*The Value of the French Alliance in the American Revolution.*"

THE CHEMICAL ESSAY PRIZES.

A prize of five dollars in books is awarded each term to that member of the Junior or Senior class who shall present the best term theme on some chemical subject.

THE GILBERT PRIZE IN OLD ENGLISH.

By the will of Howard Worcester Gilbert, who died in Chester County, March 5, 1895, a bequest was left to the college, with the provision that a gold medal of the value of forty dollars should be awarded every two years to the student writing the best essay on the Old English Language and Literature, beginning with Beowulf, in the earliest Anglo-Saxon period, and extending down to the year 1070. Should the competitors be of equal merit, preference is to be given to residents of Pennsylvania.

The medal is an inch and three-fourths broad, three-sixteenths of an inch thick, and contains on its face a relief portrait of King Alfred, with the date 871-901, surmounted by the Anglo-Saxon phrase, "Naes he gold hwaete." The reverse shows a garland encircled with the legend, "Howard Worcester Gilbert Old English Prize. Founded 1895." Space is left for the name of the recipient.

This prize will be awarded at the Commencement of 1911. It is open to competition of students of Anglo-Saxon in the graduate courses of 1909-'10 and 1910-'11. The essay must be handed in by May 1, 1911.

'85 PRIZE IN PHYSICS.

The class of 1885 founded a prize in 1897 in the sum of \$500, the annual income of which is given to that member of the Junior class who attains the highest rank in the studies of physics.

THE BLOOMBERGH PRIZE.

The class of 1888 at its decennial reunion, subscribed the sum of \$500, the annual income of which is awarded to that member of the Junior class who shall attain the greatest proficiency in the study of the French and German languages and their literatures.

THE B. F. BARGE GOLD MEDAL.

A prize of a gold medal of the value of \$100 was founded by Benjamin F. Barge, Esq., of Mauch Chunk, Pa., to be awarded to that member of the Senior class who shall deliver the best oration in an annual contest to be held on Memorial Day, May 30th. The contestants, not more than six in number, are to be chosen by a committee of the faculty from those members of the Senior class,

who shall hand in orations on or before May 1st upon topics assigned by the committee not later than March 11th of each year.

BARGE MATHEMATICAL PRIZES.

By the bequest of the late Benjamin F. Barge, Esq., of Mauch Chunk, three prizes have been established for excellence in mathematical studies. These prizes will be awarded to members of the Sophomore class for excellence in the solution of original problems.

THE R. B. YOUNGMAN GREEK PRIZE.

The class of 1884, at its vigintennial reunion, subscribed the sum of \$500, the income of which is to be awarded to that member of the Sophomore class who shall attain the greatest proficiency in Greek.

THE NEW SHAKSPERE SOCIETY'S PRIZE.

A prize of books is awarded to that member of the Junior class who passes the best general examination upon Shakspeare, his works, life, character, etc.

NOTE.—In all cases where a prize is awarded to an essay or oration the successful competitor must hand to the proper authority two typewritten copies of his production before receiving the prize, if he is requested to do so.

RECENT ADDITIONS.

The Department of Mining Engineering and Graphics has received an exhibit of mine safety lamps and acetylene lamps from Freeman and Wolf, Zwickau, Germany, mine trolley hangers from J. Freund, '98, and H. M. Hirst, '08; mine blue prints from E. S. Tillinghast, '00; treatise in laboratory methods of grading and analyzing ores from F. H. Uhler, '06; photographs from Browning Engineering Co., Cleveland, Ohio; Mexican mine maps from G. J. Kennedy, '01. 40 lantern slides of mining machinery from Ingersoll-Rand Co., No. 11 Broadway, N. Y. 125 books for mine library from Mrs. J. M. Silliman, Easton, Pa. Steel tie for mine railway from Carnegie Steel Co., Pittsburg, Pa. Framed pictures from S. Flory Co., Bangor, Pa.

The Department of Chemistry has received gifts from Dr. Wm. McMurtrie '71, L. C. Shank '12, M. O. Cedarquist '12, Harbison

and Walker, Pittsburg, Pa., Edward B. Cook, Pottstown, Pa., and C. E. Munroe, Washington, D. C.

The Department of Physics has received valuable additions from C. Willis Bixler & Co., Easton, Pa., and W. B. Drinkhouse, '08.

DEGREES CONFERRED.

HONORARY DEGREES.

June 23, 1909.

DOCTOR OF LAWS.—Oscar H. Allis, M.D., '64, of Philadelphia. William T. Fee, '76, United States Consul at Bremen, Germany.

DOCTOR OF DIVINITY.—Rev. Isaac J. Lansing, pastor Green Ridge Avenue Presbyterian Church, Scranton. Rev. Henry H. Apple, President-Elect of Franklin and Marshall College.

DEGREES IN COURSE.

June 23, 1909.

BACHELOR OF ARTS.—O. T. Barnes, Pa.; H. J. Bell, N. Y.; R. D. Bird, N. Y.; H. R. Chidsey, Pa.; D. R. Edwards, N. J.; N. R. Foster, Pa.; F. A. Gehr, Pa.; W. H. Hartzell, Jr., Pa.; R. H. Hutchison, Pa.; C. F. Maxwell, Pa.; E. A. Mewhinney, Pa.; S. J. Mills, China; W. C. Ross, Del.; R. A. Sawyer, Jr., Pa.; I. J. Shafer, Pa.; B. W. Simpson, Ill.; R. S. Walter, Pa.; A. J. Wight, N. J. Total, 18.

BACHELOR OF PHILOSOPHY.—W. E. Brown, N. J.; W. W. Craig, N. J. (Oct. 20, 1909); C. E. Fee, Germany; T. R. Lathrope, Pa.; A. R. McLaughlin, Pa.; E. D. Manley, N. Y.; H. S. Newins, N. Y.; M. D. Steever, D. C.; E. M. Troutfelt, Pa.; F. H. Wells, Pa. Total, 10.

BACHELOR OF SCIENCE.—R. C. Kay, Pa.; A. R. McMeen, Pa. Total, 2.

CIVIL ENGINEER.—F. B. Davenport, Pa.; H. G. DeWitt, Pa.; L. C. Dodge, Pa.; H. W. Fields, Pa.; J. W. Green, Pa.; R. Johannecht, Va.; M. B. Knowles, Pa.; W. J. Kocher, Pa.; C. P. Mayfield, D. C.; P. E. Mebus, Pa.; J. T. Paxson, Pa.; H. K. Preston, N. J.; S. S. Riddle, Pa.; H. T. Spengler, Pa.; G. F. Walter, Pa.; H. D. Rogers, '08, N. Y. Total, 16.

ELECTRICAL ENGINEER.—A. L. Jones, Pa.; G. F. Metz, Pa.; A. C. Nolf, Pa.; R. A. Sandt, Pa.; A. P. Schneider, Pa. Total, 5.

MINING ENGINEER.—E. C. Moore, N. Y.; F. B. Watkins, D. C.; A. A. Wren, '05, Arizona. Total, 4.

BACHELOR OF SCIENCE IN CHEMISTRY.—M. C. Carter, Pa.; F. H. Lerch, Jr., Pa.; E. Ross, Pa.; R. P. Schelly, N. J.; C. F. Schoen, Pa.; J. P. Snyder, Pa. Total, 6.

MASTER OF ARTS.—F. E. Shnyder, '99. Total, 1.

Total—First Degree, 61.

COMMENCEMENT DISTINCTION, 1908.

HONORS.—David Reed Edwards, Northfield, N. J. (Latin Salutatory); Carl Frederick Schoen, Scranton (Scientific); Irvin Jonathan Shafer, Reading (Valedictory).

ORATIONS.—Otis Tiffany Barnes, Philadelphia; Remsen DuBois Bird, Rondout, N. Y.; William Eustis Brown, Boonton, N. J.; Marvin Clarence Carter, Scranton; Harold Russell Chidsey, Easton; William Warren Craig, New Germantown, N. J.; Frank Andrew Gehr, Greensburg; John Wagener Green, Easton; William Henry Hartzell, Jr., Easton; Robert Harris Hutchison, Malvern; Alvan Rufus McLaughlin, Dunmore; Howard Kent Preston, Trenton, N. J.; Elbert Ross, Bangor; Robert Amandus Sandt, Easton; Rollin Alger Sawyer, Jr., Harrisburg; B. William Simpson, Chicago, Ill.; Miller Didama Steever, Washington, D. C.; George Franklin Walter, Easton.

PRIZES AWARDED.

SENIOR PRIZEMEN.

THE FRANCIS A. MARCH PHILOLOGICAL PRIZE: Remsen D. Bird, Rondout, N. Y.

THE ASTRONOMICAL PRIZE: John W. Green, Easton, Pa.

THE BASSETT PRIZE IN CIVIL ENGINEERING: First prize, divided equally between Joshua T. Paxson, Deshertown and Howard K. Preston, Trenton, N. J. Second prize, divided equally between Harry T. Spengler, Easton, and George F. Walter, Easton.

GILBERT PRIZE IN OLD ENGLISH: Irvin J. Shafer, Reading.

THE CHEMICAL ESSAY PRIZES: Carl F. Schoen, Scranton.

SENIOR DEBATE.

QUESTION: *Resolved, "That the Republican Party should carry out the pledge of 'Tariff Revision' by sweeping reductions in all schedules affecting the poor man's food and dress, and the profits of so-called Trusts."*

SPEAKERS.

Washington Hall.

B. Wm. Simpson, *affirmative*.
 M. Didama Steever, *negative*.
 Marvin C. Carter, *affirmative*.

Franklin Hall.

William E. Brown, *negative*.
 David R. Edwards, *affirmative*.
 Samuel T. Mills, *negative*.

FIRST PRIZE: William E. Brown, Boonton, N. J.

SECOND PRIZE: M. Didama Steever, Washington, D. C.

THIRD PRIZE: Samuel J. Mills, Chefoo, China.

B. F. BARGE GOLD MEDAL PRIZE: Otis T. Barnes, Philadelphia.

JUNIOR ORATORICAL PRIZES.

Franklin Hall.

Clinton E. Steinheiser.
 Robert L. Ware.
 Arthur E. Keiber.
 Thomas C. Jeffery.

Washington Hall.

Albert F. Kahn.
 Philip A. Swartz.
 John H. Dalrymple.
 John F. A. Moore.

FIRST PRIZE: Albert F. Kahn, Easton.

SECOND PRIZE: J. F. A. Moore, Hornell, N. Y.

THIRD PRIZE: John H. Dalrymple, West Orange, N. J.

THE CLASS OF '85 PRIZE IN PHYSICS: George F. Alrich, Easton.

THE BLOOMBERGH PRIZE IN MODERN LANGUAGES: J. F. A. Moore, Hornell, N. Y.

JUNIOR PRIZEMAN.

THE SHAKESPEARE PRIZE: Philip A. Swartz, Poughkeepsie, N. Y.

SOPHOMORE PRIZEMEN.

THE CLASS OF '83 PRIZE IN ENGLISH: Charles B. Swartz, Poughkeepsie, N. Y.

THE TRAIL GREEN PRIZE IN MATHEMATICS: William Aston, Wilkes-Barre; William Warfield, Easton.

THE B. F. BARGE MATHEMATICAL PRIZES:

FIRST: Carl S. Rankin, Scranton.

SECOND: William W. Perry, Easton.

THIRD: John O. Rinek, Easton.

THE LOUNSBURY PRIZE IN CHAUCER: Paul Hutchinson, Bayonne, N. J.

THE R. B. YOUNGMAN GREEK PRIZE: Charles B. Swartz, Poughkeepsie, N. Y.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE: Clarence E. Feick, Reading.

FRESHMAN PRIZEMEN.

THE LYMAN COLEMAN BIBLICAL PRIZES.

DIVISION A: Howard L. Benson, Washington, D. C.

DIVISION B: Herman A. Dann, Titusville.

DIVISION C: Michael J. Kasprzak, Perth Amboy, N. J.

DIVISION D: Kemper G. McComb, Haddonfield, N. J.

DIVISION E: William G. Simpson, Elizabeth, N. J.

DIVISION F: Frank B. Wildrick, Columbia, N. J.

THE PARK PRIZE IN LATIN: William G. Simpson, Elizabeth, N. J.

CLASS MONITORS.

Appointed for general excellence in study:

SENIOR CLASS: P. A. Swartz.

JUNIOR CLASS: C. B. Swartz.

SOPHOMORE CLASS: H. L. Benson.

FRESHMAN CLASS: J. I. Henshaw and J. E. Shambach.

THESES PRESENTED BY CANDIDATES FOR DEGREES IN THE TECHNICAL COURSES OF THE PARDEE SCIENTIFIC DEPARTMENTS.

1. Effect of Non-freezing Agents on Steel Embedded in Concrete.
MAHLON BUNTING KNOWLES, Yardley.
CLIFTON POOL MAYFIELD, Washington, D. C.
2. Strength of Various Forms of Concrete Joints.
HARRY T. SPENGLER, Easton.
GEORGE FRANKLIN WALTER, Easton.
3. Examination of the Delaware River as a Source of Supply of Easton.
HOWARD WALKER FIELDS, Media.
PERCY ELWOOD MEBUS, Easton.

4. Stress Diagrams of Reinforced Concrete Beams.
JOSHUA T. PAXSON, Dreshertown.
HOWARD KENT PRESTON, Trenton, N. J.
 5. Effect of the Impurities of Sand upon the Tensile Strength of Cement Mortars.
FRANK BELIN DAVENPORT, Wilkes-Barre.
SILAS SWALLOW RIDDLE, Bloomsburg.
 6. Examination of the Flow of the Lehigh River.
HARRY GARDNER DEWITT, Scranton.
LINCOLN COOK DODGE, Hazleton.
RICHARD JOHANKNECHT, Rock Castle, Va.
 7. Investigation to Determine the Laws of Discharge of Free and Submerged Weirs.
JOHN WAGENER GREEN, Easton.
WALTER JOHN KOCHER, Easton.
 8. The Geology, Drilling and Timbering at Franklin Furnace, N. J.
EDWARD CORBIN MOORE, Flushing, N. Y.
 9. Mines of the New Jersey Zinc Company at Franklin Furnace, N. J.
FRANCIS BENJAMIN WATKINS, Washington D. C.
 10. The Great Falls Plant of the Boston and Montana Company.
ANDREW ADDISON WREN, Arizona.
 11. The Lowe Water Gas Process.
CARL FREDERICK SCHOEN, Scranton.
 12. Design and Construction of an Eddy-Current Brake.
ADDISON LESLIE JONES, Easton.
GEORGE FRANKLIN METZ, Hazleton.
 13. A Study of Armature Reactions in Direct Current Dynamos.
ALVIN CLYDE NOLF, Easton.
 14. Dielectric Strength of Insulating Materials.
ROBERT AMANDUS SANDT, Easton.
ADOLPH PHILIPP SCHNEIDER, Honesdale.
- The Salts of Para-sulfo-metamido Benzoic Acid:
15. Lead, Zinc and Manganese Salts.
MARVIN CLARENCE CARTER, Scranton.
 16. Barium, Strontium and Calcium Salts.
FRANK HILL LERCH, JR., Easton.
 17. Cobalt, Nickel and Rubidium Salts.
ELBERT ROSS, Bangor.

18. Sodium, Potassium and Lithium Salts.

RALPH PERCY SCHELLY, Phillipsburg, N. J.

19. Copper, Cadmium and Mercury Salts.

JOHN PAUL SNYDER, Easton.

THE ALUMNI ASSOCIATION.

The Alumni Association is composed of graduates of the College and such former students as left College before graduation, in good standing, as may be elected. The annual meeting is held on Tuesday, preceding Commencement Day.

The Association has the privilege of choosing, every alternate year, two members of the Board of Trustees, who hold office for six years. In June, 1908, Simon Cameron Long, '77, of Pittsburg, and John E. Fox, '85, of Harrisburg, were chosen. In the Spring of 1910 two more will be voted for.

The Executive Committee is as follows: McCluney Radcliffe, M.D., '77, Chairman, Philadelphia; Fred R. Drake, '86, Easton; James W. Fox, '88, Easton; Rush N. Harry, '89, New York, N. Y.; Casper Dull, '77, Harrisburg; A. C. Overholt, '84, Scottdale; J. F. Valient, '88, New York, N. Y.

It is desirable to keep up the full record, so long maintained, of the residences, occupations, literary efforts, and public services of the alumni and former students of the college.

Information is solicited in regard to these points, and also in reference to matters appropriate to the obituary record, which is annually prepared for the alumni association.

Each alumnus is asked to send his personal record, carefully revised to date, to the secretary before May 1, 1910.

LOCAL ASSOCIATIONS.

ALUMNI ASSOCIATION OF LAFAYETTE.

ROBERT F. WHITMER, '85, Philadelphia.....*President*JAMES MADISON PORTER, '86, Easton.....*Vice-President*REV. J. F. STONECIPHER, D.D., '74, Easton...*Sec. and Treasurer*

THE LAFAYETTE ALUMNI ASSOCIATION OF NORTH-EASTERN PENNSYLVANIA.

ALEXANDER BRYDEN, '71, Dunmore.....*President*OSCAR J. HARVEY, '71, Wilkes-Barre.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF PHILADELPHIA AND VICINITY.

REV. J. GRAY BOLTON, '72, Philadelphia.....*President*

CHARLES B. ADAMSON, 76 East Logan St., Germantown, Phila
.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF NEW YORK AND VICINITY.

WILLIAM E. BAKER, '77, New York.....*President*

JOSEPH O. SKINNER, '02, 84 William Street, New York....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF THE WEST BRANCH.

FRED. H. PAYNE, '88, Williamsport.....*President*

R. FLEMING ALLEN, '90, Williamsport.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF CENTRAL PENNSYLVANIA.

REV. A. N. HAGERTY, '81, Carlisle.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF WESTERN PENNSYLVANIA.

EDWARD C. CHALFANT, '95, Pittsburg.....*President*

HENRY LLOYD, JR., '03, Pittsburg.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF MARYLAND.

ROBERT H. SMITH, '67, 53 St. Paul Street, Baltimore.....*President*

PEARCE KINTZING, M.D., '81, Baltimore.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF CHICAGO AND VICINITY.

W. F. JOHNSON, '91, Chicago.....*President*

LAMBERT HENDLEMAN, '98, 94 Market Street, Chicago....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF THE NORTH-WEST.

REV. GEO. C. POLLOCK, D.D., '61, Litchfield, Minn.....*President*

HON. JAMES T. HALE, '77, Duluth, Minn.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF WASHINGTON, D. C.

JAMES F. R. APPLEBY, M.D., '64, Georgetown.....*President*

SNOWDEN ASHFORD, '88, 918 Farragut Square.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF NEW JERSEY.

WAYNE DUMONT, '92, Paterson, N. J.....*President*
FREDERICK F. KENNEDY, '98, 774 Broad Street, Newark
N. J.....*Secretary.*

ASSOCIATION OF ST. LOUIS AND THE SOUTHWEST.

REV. C. L. CHALFANT, '89, St. Louis.....*President*
H. P. G. COATES, '92, St. Louis.....*Secretary*

JUNIOR ALUMNI ASSOCIATION OF EASTON.

C. F. OLDT, '00, Easton.....*President*
H. B. MOON, '99.....*Secretary*

STUDENTS.

GRADUATE STUDENTS.

S. B. Gillhuly, A.M., N.J.	History and English Literature,	Lafayette, '86.
J. B. Hench, A.M., Pa.	Latin,	Lafayette, '83.
Allan Roberts, Ph.B., M.S., Pa.	History and Political Science,	Lafayette, '99.
C. F. F. Garis, Ph.B., Pa.	Mathematics and German,	Lafayette, '03.
W. M. Smith, Ph.B., Pa.	Mathematics and Astronomy,	Lafayette, '03.
J. W. Colliton, C.E., E.M., Pa.	Mining Engineering,	Lafayette, '06.
William H. Kirkpatrick, A.B., Pa.	History and Political Science,	Lafayette, '05.
Carmon Ross, Ph.B., Pa.	Modern Languages,	Lafayette, '05.
Rev. Lewis S. Trump, A.M.	Philosophy,	Muhlenberg, '00.
Leo A. Gates, A.B., Pa.	Latin and English,	Lafayette, '08.
Cyrus H. Williston, B.S., N. J.	Chemistry and Biology,	Lafayette, '08.
William T. Foster, Ph.B., N. J.	Zoology, Botany and Geology,	Lafayette, '06.
Howard B. Bartolet, A.B.	Mathematics and Physics,	Lafayette, '08.

GRADUATES 14

SENIOR CLASS, 1910.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
George Frederick Alrich.....	E.E....	Easton, Lachenour Heights	
Paul Mitchell Arndt.....	E.E....	Phillipsburg, N. J.,	
		3 Chambers	
George Calvin Baker.....	L.....	Noxen.....	173 E.
Arthur Augustus Blaicher.....	E.M....	Newark, N.J.....	X Φ
Robert Franklin Brown.....	C.....	Easton.....	R. F. D. 4
Hilton Roy Campbell.....	Sp'l....	Richmond Hill, N. Y.	
		230 McC.	
John Cawley.....	G.S....	Springtown.....	33 S.
John Boyer Cline.....	E.E....	Stewartsville, N. J....	Home
Warren John Conrad.....	C.....	Reading.....	101 McK
Isidor Coons.....	L.....	Wilkes-Barre.....	94 McK.
Joseph Force Crater, Jr.....	C.....	Easton.....	5th and Ferry
Wilson Crawford.....	E.E....	Summit Hill.....	33 S.
Springer Lawrence Cuning-			
ham, Jr.....	E.E....	Pittsburg.....	139 F.
John Hart Dalrymple.....	C.....	West Orange, N. J....	Brd.
Joseph Benson Darlington†...	Ch....	West Chester.....	Δ K E
William Walker Darsie.....	E.M....	Pittsburg.....	θ Δ X
James Shackelford Dauerty...	C.....	Philadelphia.....	68 B.
Alvan Yost Deisroth.....	L.....	Hazleton.....	83 N.
Joseph Jay Durfee.....	C.E....	Covington, N. Y.....	37 S.
William Thomas Edgell.....	E.E....	Wilkes-Barre.....	127 M.
Ralph Lawrence Ely.....	C.....	Allegheny.....	147 P.
Milton Rutherford Evans.....	E.M....	Plymouth.....	15 S.
Orville Crawford Fay†.....	C.....	Hollidaysburg.....	Φ K Ψ
Reuben Frank Giest†.....	E.M....	Easton.....	231 Berwick
William Fogg Goodwin.....	E.E....	Bridgeton, N. J.....	68 B.
Arthur Rand Gordon.....	E.M....	West Hampton, N. Y.,	
		170 E.	
Abram Packer Hays.....	L.....	Munhall.....	θ Δ X
Daniel Ackerman Herrick.....	L.....	Kingston, N. Y.....	130 M.
William Blake Hindman.....	C.....	Chillicothe, O.....	θ Δ X
Burton Hotchkiss.....	C.E....	Washington, D. C.....	134 M.
George Webster Hunt.....	C.E....	Riegelsville, N. J.....	Home
Frank Elison Hutton.....	C.E....	Kingston, N. Y.....	Φ K Ψ

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Frank Henry Irmischler.....	C.E.....	Easton.....	99 McK.
Thomas Cowling Jeffery.....	C.....	Pen Argyl.....	116 McK.
Floyd Myron Johnson.....	C.E.....	Covington.....	134 M.
Edward Huntting Jones.....	C.....	East Hampton, N. Y.,	Brd.
Albert Barnes Judson.....	Ch.....	Meshoppen.....	147 P.
Albert Felix Kahn.....	L.....	Easton.....	37 S. 6th
Arthur Emanuel Keiber.....	C.....	Drums.....	64 B.
Frank Henry Kelly†.....	C.E.....	Reedsville.....	Ø Δ Ø
Henry Reuben Koehler.....	C.....	Hazleton.....	171 E.
Gideon Richie Kreider, Jr.†...	G.S.....	Annaville.....	Δ K E
William Stanley Lanterman†.	E.M...	Easton.....	—
Davis Winans Lusk†.....	C.....	Newark, N. J.....	X Ø
George Shiffer McCaa.....	E.M...	Plains.....	133 M
Frederick Collier McCutcheon..	C.....	Sharpsburg.....	Ø Δ X
Robert Eton McPherson.....	C.....	New Bloomfield.....	50 S.
Harry Wilmer Markle.....	L.....	Greensburg.....	92 McK.
Willard Charles Masonheimer	C.....	Weatherly.....	83 N.
Raymond Stanley Metzgar....	E.E....	Phillipsburg, N. J.,	71 Bennett
Nathan Roy Miller†.....	L.....	Mauch Chunk.....	100 McK.
Thomas Overfield Mitman....	C.....	Hellertown.....	3 S.
John Francis A. Moore.....	L.....	Hornell, N. Y.....	130 M.
Arthur Henry Myers.....	L.....	Somerville, N. J.....	169 E.
John Sanford Noble, Jr.....	L.....	Easton.....	226 Porter
Joseph Oliver Parker.....	L.....	Pittsburg.....	Ø Δ X
Donald Rankin.....	Ch.....	Scranton.....	70 B.
David Weimer Rial.....	Ch.....	Greensburg.....	115 McK.
Frank Weimer Royer.....	E.E....	Greensburg.....	Ø Δ Ø
August Henry Schaaf†.....	C.E.....	Baltimore, Md.....	148 P.
Joseph Albert Skeer†.....	C.....	Bloomsburg.....	Δ K E
Louis Thurston Southwick....	C.E.....	New York, N. Y.....	Δ K E
Clinton Emanuel Steinheiser..	C.....	Mauch Chunk.....	116 McK.
David Lloyd Swank†.....	G.S....	Mauch Chunk.....	Δ K E
Philip Allen Swartz.....	C.....	Poughkeepsie, N. Y.	131 M.
Elmer Clayton Taylor.....	Ch.....	Cold Spring.....	145 P.
Reuben Archer Torrey, Jr....	C.....	Montrose.....	80 N.

NAME.	COURSE OF STUDY, RESIDENCE.		ROOM.
Norman Clifford Uhler.....	C.....	Easton.....	R. F. D. 2
Harry Taylor Updegrove.....	E.M. ..	Easton.....	Paxinosa Ave.
Roy Irving Walter.....	C.....	Easton.....	4th and Bushkill
Robert Lothrop Ware.....	C.....	Easton...	E. Paxinosa Ave.
Arthur Trumbull Warner.....	E.E....	Orange, N. J.....	87 N.
George Albert Wellman.....	C.E....	Covington.....	37 S.
Charles Preston Woodnutt....	E.E....	Williamsport.....	87 N.
Milton K. Yorks.....	C.....	Bloomsburg.....	X Ø
Joseph Henry Zerbey, Jr.....	L.....	Pottsville.....	135. F.
SENIORS.....			76

JUNIOR CLASS, 1911.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
James Hezekiah Allen.....	L.....	Kinton, O.....	135 F.
Henry Bunn Anderson.....	Ch.....	Bloomsbury, N. J....	Home
William Aston.....	C.....	Wilkes-Barre.....	43 S.
Allen Eugene Bacon.....	L.....	Wilkes-Barre.....	105 McK.
Edward Raymond Barnard ...	C.....	Hamilton, Ontario....	Brd.
Lawson Henry Bauer.....	Ch.....	Mertztown.....	91 McK.
Harry Edwin Beadell.....	Ch.....	Easton.....	1028 Lehigh St.
Frederick Heman Beeman ...	E.E....	Union, N. Y.....	49 S.
Charles Robert Bellamy.....	Ch.....	Scranton.....	79 N.
Frederick Luther Bentley.....	Ch.....	Camden, N. J.....	161 E.
Roscoe Conklin Berlin.....	E.M....	Slatington.....	Ø Δ Θ
Charles Knilsey Boas.....	E.E....	Harrisburg.....	Δ K E
Van Tuyl Boughton.....	C.E....	Valley Falls, N. Y.	122 McC.
Floyd Thomas Bower.....	C.....	Wind Gap.....	Home
John George Boyd.....	L.....	Canaseraga, N. Y....	61. B
Robert Albert Christman.....	L.....	Kresgeville.....	41 S.
Myron Judson Conover.....	E.M....	Matawan, N. J.....	Δ K E
William Daniel Conrad.....	C.E....	Reading.....	101 McK.
Harold Croasdale.....	Ch.....	Delaware Water Gap,	
			119 McK.
Donald VanLear Downs.....	C.E....	Dover, Del.....	Δ K E.
George Bache DuBois.....	C.E....	Washington, D.C.,	
			X Ø
Henry Wilmot Eckel.....	C.E....	Washington, N. J.....	37 S.
Robert Moore Eyster.....	E.M....	Chambersburg.....	Ø K Ψ
Clarence Edgar Feick.....	L.....	Reading.....	102 McK.
Theodore Sands Fillmore†....	C.E....	Shickshinny.....	Δ K E
Edwin Clyde Foresman.....	C.....	Ford City.....	80 N.
Rollin Proctor Gilbert.....	Ch.....	Camden, N. J.....	81 N.
Philip Lyman Hand†.....	C.....	Wilkes-Barre.....	Z Ψ
Horace Morgan Hess.....	C.....	Phillipsburg, N. J.,	
		Kroner's Block	
Wilmer Jacob Hindenach.....	C.....	Durham.....	Home
Max Hirsch.....	G.S....	Pittsburg.....	111 McK.
Raymond Solt Hittinger.....	C.....	Easton.....	322 N. 12th
Samuel Goodman Hoffenstein L.....		Wilkes-Barre.....	105 McK

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM
Oliver Alexander Horner.....	E.E.....	Emmitsburg, Md.....	69 B.
William Patrick Howard.....	E.E.....	Duquesne.....	\emptyset K Ψ
Nicholas Van Reed Hunter....	E.M....	Wyncote.....	Z Ψ
Paul Hutchinson.....	L.....	Bayonne, N. J.....	61 B.
Omar Harrison Keller.....	L.....	Doylestown.....	151 P.
William Cummings Kidd.....	C.....	Philadelphia.....	41 S.
Floyd Johnson Kintner.....	C.....	Easton.....	1001 Butler
Jeremiah Alexander Klotz....	C.....	Northampton.....	107 McK.
Hans Heinrich Kudlich.....	E.M....	Drifton.....	27 S.
Jacob Servus LaRue.....	C.....	Glenmore, N. J.....	36 S.
Martin Hoffman Lindabury....	E.E....	Frenchtown, N. J.....	90 N.
John Sheridan Linn.....	C.....	Paoli.....	43 S.
Lester Long.....	C.E....	Summit, N. J.....	\emptyset Δ θ
Samuel Bingham Luccock....	L.....	Oak Park, Ill.....	θ Δ X
George McCahon.....	C.....	Kilrea Co., Derry, Ireland,	2 S.
Russell McCauley.....	C.....	Altoona.....	\emptyset Δ θ
Henry Stanley McGarrah.....	E.E....	Scranton.....	1440 Washington
Audley Lytle Mabon.....	C.....	Indiana.....	\emptyset K Ψ
Walter Ingham Macaulay....	E.E....	Phillipsburg, N. J.,	411 S. Main
Jesse Russel Matson†.....	G.S....	Wellsboro.....	75 N.
Philip Maue.....	E.M....	Hazleton.....	29 S.
Walter Henry Mechler.....	L.....	Jenkintown.....	50 S.
Ambrose Frederick Melan†....	L.....	Wilkes-Barre.....	109 McK.
Arthur Richards Miller.....	E.E....	Holland, N. J.....	90 N.
Frederich Adolphus Miller....	L.....	Madison, N. J.....	θ Δ X
Harry Worthington Mixsell....	C.E....	Phillipsburg, N. J....	Home
Ralph Clark Nash.....	E.E....	Warren, Ohio.....	Z Ψ
Walter Arthur Norrist†.....	Ch....	Troy, N. Y.....	2 X
Jesse Spencer Parsons.....	L.....	Media.....	163 E.
Clarence Gammill Peattie....	E.M....	Saratoga Springs, N. Y.,	138 F.
William Walter Perry.....	E.E....	Easton.....	137 So. 13th
Stewart Rice Race.....	C.....	Cornish, N. J.....	115 McK.
Carl Seib Rankin.....	C.E....	Scranton.....	70 B.
James Henry Reeder.....	C.E....	Hughesville.....	27 S.

JUNIOR CLASS.

161

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Archibald Murray Richmond.	C.	Boonton, N. J.	99 McK
John Oswald Rinek.	E.M.	Easton.	422 Reeder
John Rosenberry Rosen- berry, Jr.	E.E.	Easton.	48 S.
John Herbert Rumbaugh	L.	Mt. Pleasant.	θ Δ X
Jesse Earl Schelling.	E.E.	Phillipsburg, N. J., 213 Chambers	
Irvin Schick.	E.M.	Hazleton.	51 S.
Leon Moyer Schwenk.	L.	Perkasie.	X Ø
Frank Carrie Shand.	E.E.	Kingston, N. Y.	114 McK.
Christian Ludewig Siebert.	G.S.	Pittsburg.	Σ X
James Robeson Smith.	E.M.	Belvidere, N. J.	109 McK.
Leland Parker Smith.	L.	Blue Point, L. I.	65 B.
Arthur Dodd Snyder.	C.	Harmony, N. J.	Home
Bernice Yorgey Spare.	C.	Limerick.	36 S.
John Elmer Stellwagon.	L.	Easton.	661 Walnut
Elijah Compton Stewart.	C.	Alexandria.	Σ X
Archibald Styer.	C.E.	Burlington, N. J.	89 N.
Charles Benjamin Swartz.	C.	Poughkeepsie, N. Y.	131 M.
Ernest Mortimer Tuttle.	C.	Newark, N. J.	Ø K Ψ
Harry Walter Vetter.	C.E.	Belvidere, N. J.	114 McK.
Gus Evans Warden†.	C.E.	Endeavor.	—
William Warfield.	C.	Easton.	
Chestnut and McCartney			
William Lambertson White, Jr.	C.E.	Easton.	
East Ave. and Monroe			
Joseph Horton Williams.	E.M.	Wellsboro.	75 K.
Edmond Talmage Witt.	C.	Jemerstown.	40 S.
Clarence Ray Wolf.	C.	Highspire.	107 McK.
Robert Woodcock.	E.M.	Hollidaysburg.	137 F.
JUNIORS.			93

SOPHOMORE CLASS, 1912.

NAME.	COURSE OF STUDY. °	RESIDENCE	ROOM
Charles Matthaei Addis.....	Ch.....	Newark, N. J.....	X Ø
Edward Leslie Bacon.....	C.....	Bridgeton, N. J.....	88 N.
Gordon Harold Bannerman ...	E.M....	Titusville, N. J.....	42 S.
Walter Amberson Barnes.....	E.M....	Pittston.....	71 B.
Walter Carl Barnes.....	C.....	Perth Amboy, N. J.....	2 S.
Harold Dumont Beatty.....	L.....	Hoboken, N. J.....	176 E.
Howard Livingstone Benson..	E.E....	Washington, D. C.	108 McK.
William Jay Bleakley.....	C.E....	Franklin.....	Ø K Ψ
Howard Milton Bliem.....	E.E....	San Antonio, Tex....	140 F.
Ross Herman Boas.....	C.E....	Harrisburg.....	Δ K E
Benjamin Ray Brown.....	C.E....	Honesdale.....	145 P.
Ralph Waldo Brown.....	E.M....	Washington, D. C.	108 McK.
John Alfred Burns.....	Ch.....	Avoca.....	172 E.
Milton Oliver Cederquist.....	Ch.....	Titusville.....	Ø Δ θ
Philip Lewis Cook.....	C.....	Wyalusing.....	44 S.
Harry Gladstone Coulter.....	E.E....	Margaretville, N. Y.,	110 McK.
William Everett Crater, Jr....	L.....	Easton.....	440 Ferry
Herman Anson Dann.....	L.....	Titusville.....	X Ø
William Franklin Danne-			
hoyer, Jr.....	L.....	Norristown.....	Ø K Ψ
David Davis.....	L.....	Summit Hill.....	174 E.
George R. Kaercher Day.....	E.E....	Hazleton.....	θ Δ X
Ralph Emerson DeKay.....	C.....	Florida, N. Y.....	34 S.
Benyew Harrison DeMott.....	Ch.....	Green Village, N. J. ...	Ø Δ θ
James Blair Easter.....	C.E....	Pittsburg.....	Δ K E
Paul Williams Emanuel.....	G.S....	Catasauqua.....	θ Δ X
William Francis Farrell.....	L.....	Wilkes-Barre.....	117 McK.
Robert Cumming Ferguson....	C.E....	New York, N. Y.....	φ Δ θ
George Benjamin Fillmore....	E.E....	Shickshinny.....	Δ K E
James Aloysius Fleming.....	Ch.....	Manchester, N. H....	150 P.
Alexander Richter Gallenkamp	E.E....	Scranton.....	—
Albert James Graham.....	E.E....	Easton.....	201 Burke
Jonathan Parsons Greenleaf...	C.....	Branchville, N. J.,	100 Cattell
Louis Eugene Griffith.....	E.M....	Rutherford, N. J.,	231 Clinton Terrace

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Harold Fetter Grim.....	C.....	Ottsville.....	98 McK.
Kenneth Cushing Grinslade...	Ch.....	Leonina, N. J.....	ϕ K Ψ
Floyd Johnson Hann.....	L.....	Phillipsburg, N. J.,	57 Filmore
Atcheson Laughlin Hench.....	C.....	Pittsburg.....	149 P.
Donald Wilson Henry.....	C.....	Athens.....	33 S.
William Vilas Hill.....	C.E.....	Bordentown, N. J.....	89 N.
George Maurice Hohl.....	L.....	Easton.....	119 Bushkill
Harold Mitten Homet.....	E.E.....	Camptown.....	11 S.
Roland Stevens Homet.....	C.....	Camptown.....	11 S.
John Eilenberg Howell.....	G.S.....	Jersey City, N. J.....	X ϕ
Robert Carter Howell.....	E.E.....	Harmony, N. J.....	Home
Marshal Hunt.....	C.....	Sussex, N. J.....	82 N.
Harry Richard Jahn.....	Ch.....	Brooklyn, N. Y.....	ϕ K Ψ
Elmer Lyon Jones.....	C.E.....	Scranton.....	86 N.
Paul Schell Kantner.....	L.....	West Easton.....	Main St.
Michael Joseph Kasprzak.....	C.....	Perth Amboy, N. J.....	156 E.
Merlin Joe Kilbury.....	G.S.....	Hornell, N. Y.....	42 S.
Jacob Vanderbilt Koontz.....	C.....	Baltimore, Md.....	34 S.
Lawrence Brandt Landrine†.....	L.....	Jersey City, N. J.....	ϕ K Ψ
Chieu Luan Li.....	C.E.....	Shantung, China,	300 Cattell
John David Lindsay.....	C.....	Wilmington, Del.....	35 S.
Harry Aaron Lipson.....	L.....	Newark, N. J.....	85 N.
William Evan Lloyd, Jr.....	E.E.....	Bangor.....	106 McK.
Harold John Lockwood.....	E.E.....	Newton, N. J.....	69 B.
Irving Kennedy Lovett.....	L.....	Red Bank, N. J.....	122 McK.
Kemper Grier McComb.....	C.....	Haddonfield, N. J.....	45 S.
Walter Walbridge McComb†.....	L.....	Tarentum, Pa.....	ϕ K Ψ
Frederick Don McCoy.....	C.E.....	Trenton, N. J.....	82 N.
George Edward McElroy.....	E.M.....	Easton.....	207 Burke
Edward Heller Maier.....	C.E.....	Bridgeton, N. J.....	88 N.
Frank Louis Napoleon Mayer.....	E.M.....	Washington, D. C.,	132 Cattell
Bertrand Frederick Miller.....	E.E.....	Trenton, N. J.....	————
Robert Walton Mumma.....	E.E.....	Steelton.....	152 P.
Harry Clayton Murphy.....	C.....	Vandergrift.....	X ϕ

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Chester Arthur Murtaugh.....	C.E....	Easton.....	60 S. Front St.
Agha Buzurkkhan Musa.....	L.....	Tabriz, Persia.....	43 S.
Charles Leonard O'Brien.....	C.....	Overton.....	150 P.
John Thomas Owens.....	L.....	Slatington.....	23 S.
Joseph Daniel Person.....	L.....	East Stroudsburg.....	98 McK.
Frank Roll Powell.....	Ch.....	Scranton.....	Δ K E
Walter William Propst.....	L.....	Archibold.....	81 N.
John Joseph Pryor.....	C.....	Hornell, N. Y.....	122 McK.
William Luther Raup, Jr.....	Ch.....	Milton.....	106 McK.
Austin Hunsicker Reeves.....	C.E....	Clinton, N. J.....	95 McK.
Howard Elvin Renkert.....	E.E....	Phillipsburg, N. J.,	
		120 Bullman	
Walter Douglas Rice.....	G.S....	Easton.....	125 Ferry
Clarence Howard Robinson.....	E.M....	Westerly, R. I.....	709 High
Edmund Joseph Roche†.....	L.....	Troy, N. Y.....	138 F.
Ernest William Roth.....	Ch.....	Wilkes-Barre.....	94 McK.
Rabbi Bernard Sadler.....	Sp.....	Easton.....	909 Jackson
Robert Samuel Schar.....	Ch.....	East Liverpool, Ohio,	
		232 McC.	
Victor Raymond Schmidt.....	C.E....	Nazareth.....	62 B.
Irving Schwed.....	L.....	Somerville, N. J.....	63 B.
Leigh Browne Shiffer.....	C.....	Easton.....	645 Ferry
Satoshi Shutow.....	Ch.....	Brooklyn, N. Y.....	175 E.
William Michael Silfies.....	C.E....	Bath.....	150 P.
William Gayley Simpson.....	C.....	Elizabeth, N. J.....	ϕ K Ψ
John Leshner Sletor†.....	E.E....	Easton.....	159 So. 4th
Harvey Harbaugh Steckel.....	L.....	Slatington.....	\emptyset Δ \emptyset
John Lander Stewart.....	L.....	Phillipsburg, N. J.,	
		104 So. Main	
Charles Edward Straub.....	L.....	Easton.....	43 So. 5th
Paul Morgan Thomas.....	C.....	Lima, Ohio.....	35 S.
Herbert Dechaut Traub.....	E.E....	Pennsburg.....	16 S.
Robert Legh Warren.....	G.S....	Shickshinny.....	137 F.
John Dorman West.....	L.....	Phillipsburg, N. J.,	
		113 Lewis	
Alex. Christian Preben Wich-			
feld†.....	Ch.....	Maribo, Denmark.....	ϕ Δ \emptyset

SOPHOMORE CLASS.

165

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Charles Oliver Williamson.....	C.....	Easton.....	East Ave.
John Andrew Wilson, Jr.....	C.E.....	Landisburg.....	45 S.
Maurice Cleveland Wilson.....	L.....	Woodland.....	85 N.
Harry Smedley Wolf†.....	Ch.....	Reading.....	102 McK.
George Rodgers Wood†.....	L.....	St. Clair.....	72 B.
Leon Harold Woolsey.....	C.E.....	New Paltz, N. Y.,	
		Lorenzo Bell's	
SOPHOMORES.....			105

FRESHMAN CLASS, 1913.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Thomas Adams.....	C.....	Brooklyn, N. Y.....	157 E.
Stewart Murray Alexander....	C.E....	Altoona.....	X Ø
Rex Baine Altschuler.....	L.....	Hackensack, N. J.....	Ø K Ψ
Robert Alexander Altschuler...	L.....	Hackensack, N. J.....	φ K Ψ
James Burns Amberson.....	L.....	Waynesboro.....	103 McK.
Charles Webster Andrews.....	E.E....	Buffalo, N. Y.....	θ Δ X
William Cutler Atwater, Jr....	L.....	Westhampton Beach, N. Y., No. 14th St.	
Lorenz Kneedler Ayers.....	Ch....	Easton.....	No. 13th St.
Samuel Seymour Ball.....	E.M....	Elmira, N. Y.....	38 S.
LeRoy G. Barton.....	C.E....	Chautauqua, N. Y.,	
<hr/>			
Harry Milton Bernstein.....	Ch....	Paterson, N. J.....	167 E.
Lester Bing.....	E.E....	Pittsburg.....	146 P.
Frederick Lucien Bird.....	C.....	Altoona.....	Lorenzo Bell's
William Miller Bond.....	C.....	Saylorsburg.....	231 Cattell
Francis Shunk Brown, Jr.....	L.....	Philadelphia.....	Z Ψ
Harry Burrows Bubb.....	E.M....	Williamsport.....	Z Ψ
Alexander Budson.....	L.....	Trenton, N. J.....	146 P.
Richard Anderson Burk.....	C.E....	Mt. Hermon, Mass.,	
			417 New.
Adam Brown Caldwell.....	C.....	Williamsport.....	168 E.
Angelo Maria Centanni.....	C.....	Philadelphia.....	154 E.
Malcolm Fairman Channell....	E.E....	Wellsboro.....	—————
Ralph Greenfield Chapman....	L.....	Newark, N. J.....	X Ø
Richard Douglas Cheesman....	Ch....	Easton.....	941 Lehigh
Henry Russell Chidsey.....	L.....	Easton. 122 Spring Garden	
			St.
Cuyler Llewellyn Clark.....	G.S....	Zanesville, Ohio...	131 McC.
Isaac Carpenter Clark.....	E.M....	Takoma Park, D. C....	47 S.
William Levin Coleman.....	C.....	Easton.....	704 Walnut
Kenneth Hendrick Colville....	G.S....	Carbondale.....	76 K.
Charles Walter Conde.....	C.E....	High Bridge, N. J....	153 E.
Carl Benjamin Cooper.....	Ch....	Homer, N. Y.....	39 S.
Aaron Ross Crane.....	E.M....	Chatham, N. J.....	φ Δ θ
John Simpson Crater.....	L.....	Easton.....	—————

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Louis Creveling.....	Ch.....	Bloomsbury, N. J.....	Home
Montgomery Fletcher Crowe..	C.....	East Stroudsburg.....	72 B.
John Edward Culp.....	E.E.....	Harwood Mines.....	127 M.
Edward Gilmore Cunningham.	L.....	Sewickley.....	78 K.
Irwin Taite Darlington.....	Ch.....	West Chester.....	Δ K E.
Raymond Herbein DeTurck...	L.....	Oley.....	110 McK.
James Gregg Dickey.....	C.E.....	Fort Washington.....	140 F.
Sidney Homer Diman.....	E.M....	New York, N. Y.....	28 S.
John Munson Doremus.....	C.E.....	Gladstone, N. J...232	McC.
Viers Dalzell Edwards	L.....	Braddock.....	74 K.
Charles Garfield Eichlin.....	C.....	Easton..1627 North-	
		ampton	
Herbert Henry Eichlin.....	L.....	Easton.....	36 So. 11th
Frank Eisberg.....	C.E.....	Easton.....	1145 Ferry
Morris Sloan Evans.....	C.E.....	Berwick.....	φ Δ θ
Edwin James Fager, Jr.....	E.E.....	Harrisburg.....	301 C.
Harry Clarence Fernau.....	C.E.....	Jeddo.....	118 McK.
James Uhler Fetherolf.....	L.....	Stockertown	Home
Jerome Edward Fishel.....	E.M....	Washington, D. C.....	47 S.
Russell Holcombe Fisher.....	L.....	Annandale, N. J.....	Home
William Edward Fitzgerald...	C.E.....	Trenton, N. J.....	76 K.
James Watson Foresman.....	C.E.....	Williamsport.....	Z Ψ
Louis Fernald Foster.....	L.....	Phillipsburg, N. J.,	
		40 Fairview Heights	
Frank Tasker Francis.....	E.M....	Easton.....	307 Burke
Harry Thorton Francis.....	G.S....	Titusville.....	X Ø
Michael Frasca.....	C.....	Philadelphia.....	154 E.
Thomas Armstrong Garretson.	Ch.....	Perth Amboy, N. J....	39 S.
Leslie Newton Gay.....	L.....	Shamokin.....	101 McC.
Newell Hardy Grace.....	L.....	Roslyn, L. I., N. Y...159	E.
George Newton Greene.....	C.E.....	Philadelphia.....	φ Δ θ
John Grimshaw, Jr.....	E.E.....	Paterson, N. J.....	157 E.
William David Gross.....	C.E.....	Kingston, N. Y.....	78 K.
William Henry Guidotti.....	Ch.....	Troy, N. Y.....	—
Robert Elliot Haas.....	L.....	Allentown.....	φ Δ θ
Arthur Browne Hammond, Jr..	L.....	West Chester.....	76 K.
Arthur Brooks Hampson.....	E.E....	Nazareth	—

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Henry Stephenson Hampson...	E.E...	Nazareth	—
Frank Waite Hanford.....	G.S...	Seattle, Wash.....	$\theta \Delta X$
John James Hartigan.....	C.E...	Hadley Falls, Mass., 132 Cattell	
William Oscar Hay, Jr.....	E.E...	Easton... 15th and Northampton	
Jay Irvin Henshaw.....	L.....	Honesdale.....	84 N.
George Heilman Heydt.....	E.E...	Lehighton.....	97 McK.
Charles Alexander Hindman..	G.S...	Chillicothe, Ohio.....	$\theta \Delta X$
LaVerne Hoar.....	L.....	Youngstown, Ohio.....	$X \phi$
James Hemphill Hoeveler....	G.S...	Pittsburg.....	—
Herbert Moses Horne.....	C.....	Vandergrift.....	$X \phi$
John Ackley Horn.....	C.E...	Easton... 1040 North- ampton	
George Edwin Horr.....	E.M...	Newark, N. J.....	$\theta \Delta X$
Vernon Taylor Houghton.....	E.E...	Washington, D. C., 132 Cattell	
Arthur Blaney Irving.....	E.M...	New York, N. Y.....	$\phi \Delta \theta$
George Howland Irwin.....	C.E...	Norristown.....	—
Lynott Richard Jones.....	C.E...	Utica, N. Y.....	148 P.
Matthew Hale Jones, Jr.....	C.....	Easton.....	$Z \Psi$
Paul Adolph Kanengeiser....	G.S...	Bessemer.....	$Z \Psi$
George Van Sise Keely.....	C.E...	Bayonne, N. J.....	232 McC.
Gordon Arnold Kelly.....	Ch....	Easton.....	128 No. 2d
Lewis Hoke Kelly.....	L.....	Latrobe.....	301 Cattell
David Francis Kennedy.....	L.....	Youngstown, Ohio.....	$Z \Psi$
John Carl Kielman.....	L.....	Portsmouth, Ohio....	165 E.
Tung Kwei King.....	C.E...	Shanghai, China..	400 High
Milton Pairie Kitchel.....	E.M...	Boonton, N. J.....	97 McK.
Milton Hugo Klein.....	G.S...	Cincinnati, Ohio..	117 McK.
Frederick Carl Krell.....	C.E...	Hazleton.....	118 McK.
Warren Woodward LaBarr....	E.E...	Winwood.....	84 N.
Allen Sheppard Lake.....	G.S...	Port Norris, N. J....	38 S.
George Washington Landis....	Ch....	Perkasie.....	92 McK.
Paul Fisher Landis.....	L.....	Swarthmore.....	$\Delta K E$
Paul Ellwood Laros.....	E.E...	Phillipsburg, N. J., 40 Fairview Heights	

NAME.	COURSE OF STUDY.	RESIDENCE	ROOM.
Joseph Walter Lassen.....	C.E.	Philadelphia.....	65 B.
Robert Allen Leshner.....	E.M.	Easton....	338 Spring Garden
John Lester Lewis, Jr.....	L.	Pittsburg.....	—
Alexander Verner Lloyd.....	G.S.	Pittsburg.....	—
Andrew McClenathen Lowry...	C.	Dewart.....	40 S.
William Anselm Lynahan.....	L.	Corning, N. Y.....	159 E.
Anthony Barrett McCormick...	L.	Wilkes-Barre.....	24 S.
Frank Thomas McInerney.....	C.E.	Easton....	616 Valley Ave.
Joseph Benedict McNally.....	E.M.	So. Bethlehem.....	—
David Burrell McWilliams.....	C.E.	Mifflinburg.....	49 S.
Sayre Paul Maddock.....	L.	Sayre.....	842 Milton Ave.
John Fackenthal Magee.....	E.M.	Easton....	Paxinosa Ave.
John Wesley Magee.....	E.E.	Easton....	Meixsell & Pierce
George Bushar Markle, Jr.....	G.S.	Hazleton.....	θ Δ X
Alexander Fulton Marshall...	C.E.	Shamokin.....	Δ K E
Charles Gaven Marshall.....	L.	Anacostia, D. C....	230 McC.
George Woodward Marshall...	E.E.	Shamokin.....	14 S
Frederick William Maue.....	E.E.	Hazleton.....	29 S.
Harold Torrey Melhuish.....	Ch.	Pittsburg.....	139 F.
Francis Kinsey Metzgar.....	C.E.	Phillipsburg, N. J.,	71 Bennett
Eugene Kearfott Miller.....	E.M.	Scottdale.....	201 Cattell
Hugh McCauley Miller.....	L.	Philadelphia.....	φ K ψ
Frederick Moorby.....	C.E.	Jamestown, N. Y....	165 E.
Harry Waters Moore.....	L.	High Bridge, N. J....	162 E.
Webster Clarendon Moore....	C.E.	East Orange, N. J.,	231 Clinton
Richard Winfield More†.....	L.	Bridgeton, N. J. .	—
Robert Lore Morrow.....	E.E.	Allenhurst, N. J.....	—
Robert Hafer Nagle.....	E.E.	Pottstown.....	16 S.
Peter John Naher.....	Ch.	Scranton.....	82 N.
Harry Emil Nelson.....	L.	Altoona... .	Lorenzo Bell's
Gilbert Nickel.....	C.	Easton....	17 So. 9th.
Andrew Dickinson Norris... .	E.E.	New York, N. Y.....	Δ K E
James Lee Pardee.....	G.S.	Hazleton.....	θ Δ X
Felix Stephen William Payer. .	L.	McAdoo.....	3 S.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Alfred Biddle Pearson.....	C.E....	Wyncote.....	Z Ψ
Russell Pellett.....	G.S....	Hamburg, N. J.....	79 N.
John Pfromm.....	Ch....	Hazleton.....	51 S.
John Carl Pickell.....	G.S....	Bloomsbury, N. J.....	Home
William Leroy Preston.....	C....	Elysburg.....	168 E.
Edwin Henry Price.....	C.E....	Easton.....	R. F. D. No. 1
Samuel Clark Price.....	G.S....	Hazleton.....	132 M.
Raymond Lewis Raub.....	L.....	Phillipsburg, N. J., R. F. D. No. 2	
Charles Knauss Reinke.....	L.....	Philadelphia.....	821 Paxinosa Avenue
Elmer Lewis Reynolds.....	C.E....	Madison, N. J.....	ϕ Δ θ
George Jacob Richards.....	E.E....	Easton.....	5 So. 11th.
Horace Broadhurst Roberts..	C.E....	Newhope.....	151 P.
Lloyd Roberts.....	L.....	Slatington.....	23 S.
Jay Leo Rothschild.....	L.....	Brooklyn, N. Y.....	167 E.
Robert Roy.....	E.E....	Wellsboro, Pa.....	X ϕ
Edgar Hoffer Royer.....	G.S....	Greensburg....	ϕ Δ θ
George Paxton Russell.....	E.M....	Scranton.....	86 N.
Albert Carl Schreiber.....	G.S....	Cincinnati, Ohio.....	θ Δ X
John Elmer Shambach.....	L.....	Williamsport.....	149 P.
Harry Thomas Shannon.....	L.....	Bath, N. Y.....	328 McC.
Alfred Weikel Shoemaker....	Ch....	Allentown.....	X ϕ
Talbot Quarrier Shrewsbury..	E.M....	New York, N. Y.....	15 S.
David Bishop Skillman.....	C....	Philadelphia.....	164 E.
Clifford Morcellis Smith.....	G.S....	Scottdale.....	—————
Coe Louis Smith.....	C.E....	Hamburg, N. J.....	ϕ Δ θ
Marco Aurelio Soto C.....	E.E....	Alajuela, Costa Rica... —	
Edgar Buckingham Spear....	G.S....	Metuchen, N. J.....	ϕ K Ψ
Alfred Leroy Spengler.....	Ch....	Easton.....	123 So. 7th.
Clayton Victor Spicer.....	C.E....	Williamsport.....	136 F.
Ellwood Hamilton Stiver.....	E.E....	Nazareth.....	62 B.
Andrew Tybout Stone, Jr....	G.S....	Holidaysburg... 313	Cattell
Lawrence Heck Stone.....	E.M....	Easton... 478	Nesquehoning
Edmund Moore Storer.....	C.E....	Trenton, N. J. ... 100	McK.
Chandler Thomas Symons....	G.S....	Saginaw, Mich.....	44 S.
Samuel Paul Teamer.....	C.E....	Malvern.....	44 S.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Seth Byron Thomas.....	C.E....	Easton.....	147 So. 9th
Max Tischler.....	L.....	Wilkes-Barre.....	67 B.
Clifford Sharp Trimmer.....	L.....	Middle Valley, N. J....	162 E.
Harry Elmer Tyson.....	Ch.....	Weatherly. 818 Berwick, Easton, Pa.	
Harold LeRoy Van Zandt....	Ch.....	Hackensack, N. J....	—
Richard Joseph Walters.....	L.....	Miners Mills.....	172 E.
Yau See Wan.....	G.S....	Canton, China.....	314 McC.
Cornelius John Ward.....	Ch.....	Phillipsburg, N. J., 21 Randall	
George Raymond Waterbor....	C.....	Easton.....	R. F. D. No. 5
William Charles Watson.....	C.....	Watertown, N. Y....	157 E.
Benjamin John Weismer.....	G.S....	Wilkes-Barre.....	—
James Robert Winner.....	L.....	Wilmington, Del....	110 McK.
Eugene Munson Wilson.....	Ch.....	Scranton.....	—
Roy Pursel Wilson.....	E.M....	Phillipsburg, N. J., 68 Bullman	
Russell Henry Wohlbach.....	E.E....	Easton.....	37 So. 13th
David Ober Wolf.....	L.....	Highspire	152 P.
Burton Guy Wood.....	G.S....	Johnstown, N. Y....	328 McC.
Ormond Worthington Wright, Jr.....	E.M....	Barnegat, N. J.....	66 B.
Thomas Allen Wright, Jr.....	C.....	Wilkes-Barre.....	28 S.
William Norris Wysham.....	C.....	Baltimore, Md.....	166 E.
John Ephraim Young.....	Ch.....	Easton	325 McC.
George Shatto Zeigler.....	C.E....	Altoona.....	Ø K Ψ
FRESHMEN.....			189

ABBREVIATION FOR BUILDINGS AND COURSES OF STUDY.

Brd.—Brainerd Hall.
 B.—Blair Hall.
 E.—East Hall.
 F.—Fayerweather Hall.
 K.—Knox Hall.
 M.—Martien Hall.
 McC.—McCartney St.
 McK.—McKeen Hall.
 N.—Newkirk Hall.

P.—Powell Hall.
 S.—South College.
 $\Delta K E$ —Fraternity House.
 ΣX —Fraternity House.
 $\theta \Delta X$ —Fraternity House.
 $\phi \Delta \theta$ —Fraternity House.
 $\phi K T$ —Fraternity House.
 $Z T$ —Fraternity House.
 $X \emptyset$ —Fraternity House.

C.—Classical.
 C.E.—Civil Engineering.
 Ch.—Chemical.
 E.E.—Electrical Engineering.

E.M. Mining Engineering.
 G.S.—General Scientific.
 L.—Latin Scientific.

† Reciting on schedule.

—Absent at time of publication of catalogue.

SUMMARY.

Courses.	Seniors.	Juniors.	Sopho- mores	Fresh- men.	Total.
Graduates.....					14
Classical.....	25	26	21	19	91
Latin Scientific.....	13	17	25	47	102
General Scientific.....	3	3	5	24	35
Civil Engineering.....	10	14	16	37	77
Electrical Engineering....	11	13	16	25	64
Mining Engineering.....	8	12	7	18	46
Chemical.....	5	8	14	20	47
Special.....	1	..	1	..	2
Totals.....	76	93	105	190	478

CLASSIFICATION BY RESIDENCE (Non-graduates).

Delaware.....	3	New Jersey....	97	Canada.....	1
Dist. of Columbia..	9	New York.....	46	China.....	3
Illinois.....	1	Ohio.....	12	Costa Rica....	1
Maryland.....	4	Pennsylvania ..	277	Denmark.....	1
Massachusetts...	2	Rhode Island. .	1	Ireland.....	1
Michigan.....	1	Texas.....	1	Persia.....	1
New Hampshire.	1	Washington....	1		

For further information, address "The Registrar, Lafayette College, Easton, Pennsylvania."



MAR 3 1911

Chicago School of Civics
and Philanthropy

VOL. 5, No. 2

FEBRUARY, 1911

BULLETIN

OF

LAFAYETTE COLLEGE

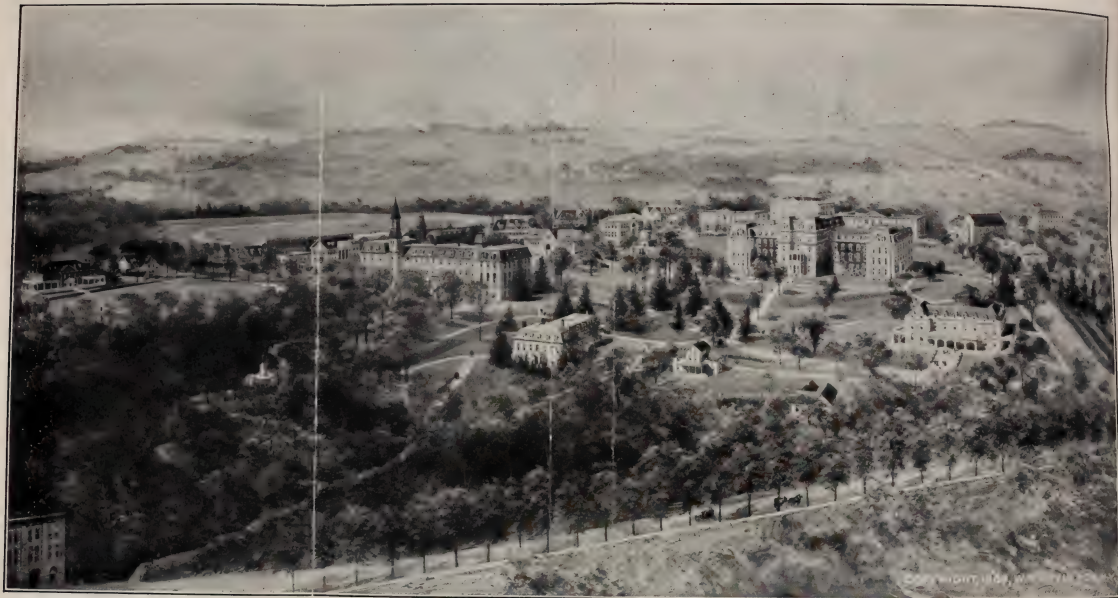
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1910-1911

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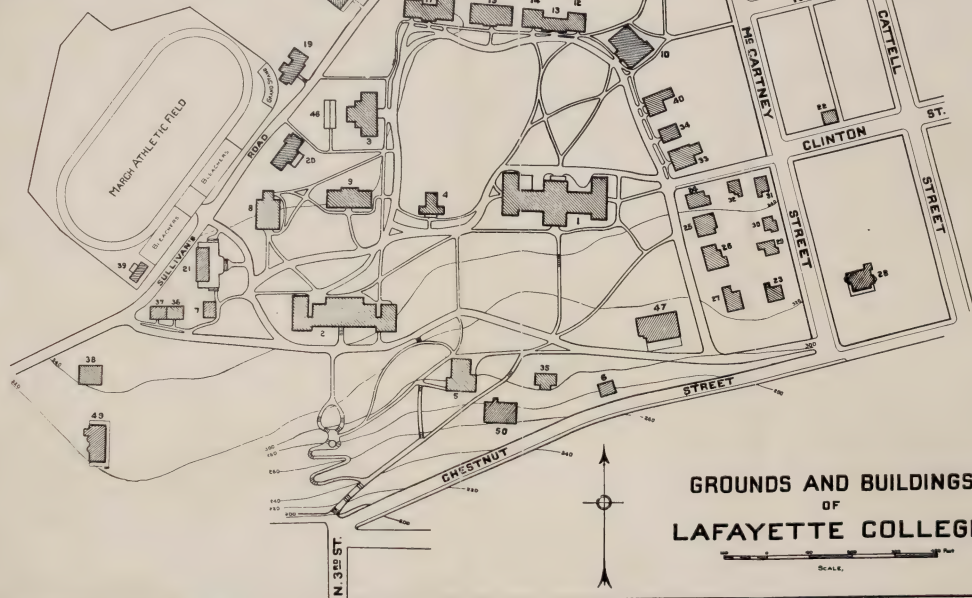
THE
JOHN CHESTER
LIBRARY



LAFAYETTE COLLEGE, EASTON, PENNSYLVANIA.

- 1 Pardee Hall.
- 2 South College.
- 3 Gayley Hall
- 4 Chemistry.
- 5 Observatory.
- 6 Jenks Biological Laboratory.
- 7 Private Laboratory.
- 8 College Office.
- 9 Gymnasium.
- 10 Van Wickley Library.
- 11 Brainerd Hall.
- 12 East Hall.
- 13 Powell Hall.
- 14 Martien Hall.
- 15 McKeen Hall.
- 16 Newkirk Hall.
- 17 Knox Hall.
- 18 Blair Hall.
- 19 Delta Kappa Epsilon.
- 20 Phi Delta Theta.
- 21 Theta Delta Chi.
- 22 Sigma Chi.
- 23 Prof. Davison.
- 24 Prof. Youngman.
- 25 Prof. Hardy.
- 26 Prof. Hall.
- 27 Prof. Lyle.
- 28 President Warfield.
- 29 Prof. Peck.
- 30 Prof. Owen.
- 31 Prof. Wysor.
- 32 Prof. Mecklin.
- 33 Prof. Coffin.
- 34 Prof. March, Jr.
- 35 Prof. Hart.
- 36 Prof. Raschen.
- 37 Mr. Smith.
- 38 Prof. March.
- 39 Field House.
- 40 Students' Clubs.
- 41 to 44 Tennis Courts.
- 46 Greenhouse.
- 47 Zeta Psi.
- 48 Phi Kappa Psi.
- 49 Chi Phi.
- 50 Central Heating Plant.

2 and 11, to 18 — Dormitories.



GROUNDS AND BUILDINGS
 OF
 LAFAYETTE COLLEGE.

B U L L E T I N O F
LAFAYETTE COLLEGE

INCLUDING THE COURSES OF STUDY

IN THE

CLASSICAL *and* SCIENTIFIC
DEPARTMENTS

AND THE

DEPARTMENTS *of* CIVIL, MINING, ELEC-
TRICAL *and* MECHANICAL ENGINEER-
ING *and of* CHEMISTRY

SEVENTY-NINTH YEAR

1910-1911

EASTON, PENNSYLVANIA

1911

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1910							1911							1912														
JULY							JANUARY							JULY							JANUARY							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
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SEPTEMBER							MARCH							SEPTEMBER							MARCH							
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OCTOBER							APRIL							OCTOBER							APRIL							
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9	10	11	12	13	14	15	9	10	11	12	13	14	15	15	16	17	18	19	20	21	14	15	16	17	18	19	20	
16	17	18	19	20	21	22	16	17	18	19	20	21	22	22	23	24	25	26	27	28	21	22	23	24	25	26	27	
23	24	25	26	27	28	29	23	24	25	26	27	28	29	29	30	31	28	29	30	
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NOVEMBER							MAY							NOVEMBER							MAY							
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6	7	8	9	10	11	12	7	8	9	10	11	12	13	5	6	7	8	9	10	11	5	6	7	8	9	10	11	
13	14	15	16	17	18	19	14	15	16	17	18	19	20	12	13	14	15	16	17	18	12	13	14	15	16	17	18	
20	21	22	23	24	25	26	21	22	23	24	25	26	27	19	20	21	22	23	24	25	19	20	21	22	23	24	25	
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11	12	13	14	15	16	17	11	12	13	14	15	16	17	10	11	12	13	14	15	16	9	10	11	12	13	14	15	
18	19	20	21	22	23	24	18	19	20	21	22	23	24	17	18	19	20	21	22	23	16	17	18	19	20	21	22	
25	26	27	28	29	30	31	25	26	27	28	29	30	...	24	25	26	27	28	29	30	23	24	25	26	27	28	29	
...	31	30	

CALENDAR.

1910.

September 15, Thursday. . . . College year began.

October 26, Wednesday. . . . Founder's Day.

December 21, Wednesday. . . . First term ends.

1911.

January 5, Thursday. Second term begins.

January 26, Thursday. Day of Prayer for Colleges.

February 22, Wednesday. . . . Senior Prize Debate.

March 22, Wednesday. Second term ends.

April 6, Thursday. Third term begins.

May 15, Monday. Junior Oratorical Contest.

May 25-31. Final Examinations of the Senior Class

May 30, Tuesday. Memorial Day, Barge Oratorical Contest.

June 13-17. Examinations of lower classes.

June 18, Sunday. Baccalaureate Sermon.

Sermon before the Brainerd Society.

June 19, Monday. Senior Class Day and Concert.

June 20, Tuesday. Literary Societies and Class Reunions.

June 21, Wednesday. Commencement Exercises.

June 22, Thursday. Examinations for Admission.

September 11, Monday. Registration for Entrance.

September 12-13. Examinations for Admission.

September 14, Thursday. . . . College year begins.

October 18, Wednesday. . . . Founders' Day.

November 30, Thursday. . . . Thanksgiving Day.

December 20, Wednesday. . . . First term ends.

1912.

January 4, Thursday. Second term begins.

January 25, Thursday. Day of Prayer for Colleges.

February 22, Thursday. . . . Senior Prize Debate.

March 21, Wednesday. Second term ends.

LAFAYETTE COLLEGE.

Lafayette College is situated at Easton, Pa., upon a site of remarkable beauty, overlooking the confluence of the Delaware and Lehigh rivers. It is thoroughly furnished with the buildings and apparatus to do the work of a progressive college and polytechnic school, and also with the equipment, so important in this age, for a healthful and wholesome student life. Its large and able faculty represent the best traditions of scholarship as well as the recent extensions of scientific knowledge and the newer methods of research. It frankly recognizes its obligation to give its students training, as well as the opportunities for acquiring knowledge, and to make its discipline include moral and spiritual culture. Recent revisions of the requirements for admission and of the courses of study have been made. It will be found that these changes meet the demands of the day for liberty of choice without sacrificing the supreme consideration of thoroughness.

Easton is a railroad center and easily accessible from all directions. It is about seventy-five miles from New York, seventy from Philadelphia, eighty from Scranton and one hundred from Wilkes-Barre and Harrisburg. The Lehigh Valley, Pennsylvania, N. J. Central, Phila. & Reading, D. L. & W., and L. & H. R. Railways afford convenient and rapid facilities for railway travel. It is also an important industrial center, and there are many advantages afforded the students in the Technical courses by its location. Its situation insures the most perfect conditions for the promotion of health.

TRUSTEES.

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CHARLES B. GREEN, <i>Secretary and Treasurer</i>	Easton, Pa.

MEETINGS OF THE TRUSTEES.

Thursday, February 9, 1911.	WINTER MEETING.
Monday, June 19, 1911.	COMMENCEMENT WEEK.
Wednesday, October 18, 1911.	FOUNDERS' DAY.

FACULTY.

REV. ETHELBERT DUDLEY WARFIELD, D.D., LL.D.,
President, Professor of History and Political Science.
(John I. Blair Foundation.)

FRANCIS ANDREW MARCH, LL.D., L.H.D., D.C.L., Litt.D.,
Emeritus Professor of the English Language and Comparative Philology.

REV. ROBERT BARBER YOUNGMAN, A.M., PH.D.,
Emeritus Professor of the Greek Language and Literature.

REV. SELDEN JENNINGS COFFIN, A.M., PH.D. Retired.
(James H. Coffin Professorship of Astronomy.)

JOSEPH JOHNSTON HARDY, A.M., PH.D.,
Professor of Mathematics and Astronomy.
(George Hollenback Professorship of Mathematics.)

WILLIAM BAXTER OWEN, A.M., PH.D.,
Professor of the Latin Language and Literature.

EDWARD HART, PH.D.,
Dean of the Pardee Scientific Department, Professor of Analytical Chemistry.
(William Adamson Professorship of Analytical Chemistry.)

JAMES MADISON PORTER, C.E.,
Professor of Civil Engineering.

FRANCIS A. MARCH, JR., A.M., PH.D.,
Professor of the English Language.
(Francis A. March Professorship.)

WILLIAM SHAFER HALL, C.E., E.M., M.S.,
Professor of Mining Engineering and Graphics.
(George B. Markle Professorship.)

EDGAR MOORE GREEN, A.M., M.D.,
Consulting Physician in the Department of Physical Training.

ALVIN DAVISON, A.M., PH.D.,

Professor of Biology.

(Jesse Chamberlain Professorship of Botany.)

FREDERICK BURRITT PECK, PH.D.,

Professor of Mineralogy and Geology.

REV. JOHN MOFFAT MECKLIN, A.M., PH.D.,

Professor of Mental and Moral Philosophy.

(James Renwick Hogg Professorship.)

JOHN FREDERICK LOUIS RASCHEN, A.M.,

Professor of Modern Languages.

CLARENCE MCCHEYNE GORDON, PH.D.,

Professor of Physics.

ALLAN ROBERTS, PH.B., M.S.,

Professor of History.

JAMES WADDELL TUPPER, PH.D.,

Professor of English Literature.

JAMES THERON ROOD, PH.D.,

Professor of Electrical Engineering.

WILLIAM THOMAS LYLE, C.E.,

Professor of Municipal Engineering.

JOHN ALEXANDER ROSS, JR., B.S.

Professor of Mechanical Engineering.

HENRY WYSOR, B.S.,

Assistant Professor of Analytical Chemistry and Metallurgy.

JAMES BRYANT HOPKINS, A.M.,

Assistant Professor of Romance Languages.

WILLIAM ALEXANDER ECKELS, PH.D.,

Associate Professor of Greek.

OTHO MCCARROLL GRAVES, B.S. in C.E.,

Assistant Professor of Graphics.

LAFAYETTE COLLEGE.

JAMES HENRY DELONG, B.S.,
Instructor in Chemistry.

* WILLIAM MACKAY SMITH, PH.B.,
Tutor in Mathematics.

JOHN ROYDEN HESS, PH.B.,
Instructor in Chemistry.

WILLIAM BENJAMIN MARQUARD, E.M.,
Instructor in Mining.

ROBERT WILLIAM THOROUGHGOOD, C.E.,
Instructor in Surveying and Railroad Engineering.

GEORGE ALBERT KOERBER, E.E.,
Instructor in Physics.

REV. ROBERT ROBINSON, A.M.,
Instructor in Hebrew.

WILLIAM HUNTINGTON KIRKPATRICK, A.B.,
Instructor in Municipal Law.

LLOYD BARRICK, A.B.,
Instructor in English.

RAYMOND HENRY LACEY, A.M.,
Tutor in Latin.

HAROLD ANSON BRUCE.
Director of Physical Training.

WILLIAM TRUMBOWER FOSTER, PH.B., M.S.,
Instructor in Biology.

REV. CARL FRIEDRICH PFATTEICHER, A.M.,
Instructor in Modern Languages.

D. ARTHUR HATCH, E.M.,
Instructor in Mathematics and Graphics.

HOWARD KENT PRESTON, C.E.,
Instructor in Mathematics and Graphics.

* Absent on leave.

J. PAUL KAUFMAN, A.M.,
Instructor in English.

JOHN CAWLEY, B.S.,
Instructor in Mathematics.

RALPH LAWRENCE ELY, A.B.,
Instructor in Mathematics.

ELMER CLAYTON TAYLOR, B.S.,
Instructor in Chemistry.

ELIJAH POTTER FAULCONER, JR., A.B.,
Instructor in Physics.

ALBERT SIDNEY MERRILL, B.S.,
Instructor in Civil Engineering.

JOHN HAWLEY LARNED, A.B.,
Instructor in Modern Languages.

MAX F. LEHMAN, A.B.,
Instructor in Mathematics.

MAURICE BROWNE, A.B.,
Instructor in English.

LEWIS ANDERSON, JR., B.S.,
Assistant in Cement Laboratory.

COLLEGE OFFICERS.

WILLIAM S. HALL, C.E., E.M., M.S.,
Clerk.

WILLIAM T. LYLE, C.E.,
Inspector of Buildings.

REV. JOHN F. STONECIPHER, D.D.,
Librarian.

REV. MAURICE A. FILSON, A.M.,
Assistant in Library.

EDWARD HART, PH.D.,
Curator of Gayley Hall, and Librarian of the Henry W. Oliver Library.

CHARLES B. GREEN, E.M.,
Registrar and Treasurer.

ALBERT MOORE LANE, PH.B.,
Bursar.

DEANS.

College..... Professor Roberts.

SENIOR CLASS..... The President.

JUNIOR CLASS..... Professors Peck and Mecklin.

SOPHOMORE CLASS. Professors Owen and Hall.

FRESHMAN CLASS... Professors Hardy, Raschen and Hopkins.

LAFAYETTE COLLEGE

ADMISSION.

Every applicant for admission to the College is expected to report at the College offices and register immediately on his arrival. Before registering he must submit to the Registrar a satisfactory certificate of moral character from some person known to the College authorities, and a diploma or certificate of graduation from the school which he last attended, or, if he be not a graduate, a statement that he leaves the school with the approval of its principal and is honorably dismissed to this College, with a statement of the studies which he has pursued and the course which he desires to pursue. His application having been approved he is admitted to the examinations. Examinations are regularly held on the day following the annual commencement day in June, and the days preceding the first day of the Autumn term in September, and also on the first day of the second and third terms.

REQUIREMENTS FOR ADMISSION TO THE FRESHMAN CLASS.

CLASSICAL COURSE.

Candidates are examined in the following subjects:

Geography (A) and (B).	English.
History (A) and (B).	Latin.
Mathematics (A).	Greek.

(For details of subjects, see pages 14-19.)

LATIN SCIENTIFIC COURSE.

Candidates are examined in the following subjects:

Geography (A) and (B).	English.
History (A) and (B).	Latin.
Mathematics (A).	German (A) or French (A).
Physics or Chemistry.	

(Candidates for the Classical and Latin Scientific Course offering Mathematics (A) and (B) can take advanced courses in Mathematics.

GENERAL SCIENTIFIC COURSE.

Candidates are examined in the following subjects:

Geography (A).	English.
History (A).	German (A) and (B) or French (A)
Mathematics (A).	and (B).
Physics or Chemistry.	

and one of the following subjects Mathematics (B); a Second Modern Language (A) and (B); Latin (Grammar, 4 books of Caesar and 2 orations of Cicero or an equivalent).

CIVIL, MINING, ELECTRICAL AND MECHANICAL ENGINEERING
AND CHEMICAL COURSES.

Candidates are examined in the following subjects:

Geography (A).	Physics or Chemistry.
History (A).	English.
Mathematics (A) and (B).	German (A) and (B) or French (A) and (B).

DETAILS OF REQUIREMENTS FOR ADMISSION.

GEOGRAPHY (A).—Political or Physical Geography.

GEOGRAPHY (B).—Ancient Geography.

HISTORY (A).—*United States*: Johnston, McMaster or Fiske.

General History: Fisher or Freeman. Such books as Myers' and Swinton's *General History* are not recommended.

HISTORY (B).—*Roman History* to Augustus, and *Greek History* to Alexander. The requirements are intended to be additional to the requirement in General History, and should be met by

the use of books on Roman and Greek History, such as Myers' "Rome, Its Rise and Fall;" Morey's, Leighton's, or Allen's Roman History, and Morey's or Oman's Greek History.

MATHEMATICS (A).—Arithmetic: Complete, including the Metric System.

Algebra: Fundamental principles. Factoring. Fractions. Simple Equations. Involution. Evolution. Exponents. Quadratic Equations. Simultaneous Quadratic Equations. Equations Solved as Quadratics. Properties of Quadratic Equations.

Geometry: Plane Geometry entire; as in Wentworth, Wells or Loomis.

MATHEMATICS (B).—Solid Geometry.

Algebra: Surds and Imaginaries. Simple Indeterminate Equations. Inequalities. Ratio. Proportions and Variations. Progressions.

Plane Trigonometry: Through the solution of right and oblique triangles (Crawley or an equivalent); candidates should bring their logarithmic tables to the examination.

PHYSICS.—The elementary principles (Avery, Gage, Hall and Bergen or Carhart and Chute).

CHEMISTRY.—Elements of Inorganic Chemistry.

ENGLISH. *Grammar.*—A general examination will be given without special reference to any particular text-book to test familiarity with paradigms and syntactical analysis, and the correct use of English idioms.

Franklin's Autobiography and Milton's Paradise Lost, Books I and II.

Prose Composition: The writing of a short essay will be required upon a subject drawn from the foregoing text-books. No candidate will be accepted in English whose work is notably deficient in point of spelling, punctuation, idioms, or division into paragraphs.

The English Requirements Recommended by the Association of Colleges and Preparatory Schools will be accepted in place of Franklin's and Milton's works.

Books to be studied: 1911: Shakespeare's *Macbeth*, Milton's *Lycidas*, *Comus*, *L'Allegro*, and *Il Penseroso*, Burke's *Speech on Conciliation*, with

America, or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*, Macaulay's *Life of Johnson*, or Carlyle's *Essay on Burns*.

In 1912: Shakespeare's *Macbeth*; Milton's *Comus*, *L'Allegro*, and *Il Penseroso* or Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur*; Burke's *Speech on Conciliation with America*, or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*; Macaulay's *Life of Johnson*, or Carlyle's *Essay on Burns*.

In 1913, 1914, 1915: Shakespeare's *Macbeth*; Milton's *L'Allegro*, *Il Penseroso* and *Comus*; Burke's *Speech on Conciliation with America* or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*; Macaulay's *Life of Johnson* or Carlyle's *Essay on Burns*.

Books to be read: 1911, 1912:

Group I (two to be selected). Shakespeare's *As You Like It*, *Henry V*, *Julius Caesar*, *The Merchant of Venice*, *Twelfth Night*.

Group II (one to be selected). Bacon's *Essays*; Bunyan's *The Pilgrim's Progress*, Part I; *The Sir Roger de Coverley Papers* in "The Spectator;" Franklin's *Autobiography*.

Group III (one to be selected). Chaucer's *Prologue*; Spenser's *Faerie Queene* (selections); Pope's *The Rape of the Lock*; Goldsmith's *The Deserted Village*; Palgrave's *Golden Treasury* (First Series), Books II and III, with special attention to Dryden, Collins, Gray, Cowper and Burns.

Group IV (two to be selected). Goldsmith's *The Vicar of Wakefield*; Scott's *Ivanhoe*; Scott's *Quentin Durward*; Hawthorne's *The House of the Seven Gables*; Thackeray's *Henry Esmond*; Mrs. Gaskell's *Cranford*; Dickens' *A Tale of Two Cities*; George Eliot's *Silas Marner*; Blackmore's *Lorna Doone*.

Group V (two to be selected). Irving's *Sketch Book*; Lamb's *Essays of Elia*; De Quincey's *Joan of Arc* and *The English Mail Coach*; Carlyle's *Heroes and Hero Worship*; Emerson's *Essays* (selected); Ruskin's *Sesame and Lilies*.

Group VI (two to be selected). Coleridge's *The Ancient Mariner*; Scott's *The Lady of the Lake*; Byron's *Mazeppa* and *The Prisoner of Chillon*; Palgrave's *Golden Treasury* (First Series), Book IV, with special attention to Wordsworth, Keats and Shelley; Macaulay's *Lays of Ancient Rome*; Poe's *Poems*; Lowell's *The Vision of Sir Launfal*; Arnold's *Sohrab and Rustum*; Longfellow's *The Courtship of Miles Standish*; Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur*; Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Evelyn Hope*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *The Boy and the Angel*, *One Word More*, *Herve Riel*, *Pheidippides*.

Books to be read: 1913, 1914, 1915 (two to be selected from each group).

Group I. *The Old Testament*, comprising at least the chief narrative episodes in *Genesis*, *Exodus*, *Joshua*, *Judges*, *Samuel*, *Kings*, and *Daniel*, together with the books of *Ruth* and *Esther*; the *Odyssey*, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII; the *Iliad*, with the omission if desired, of Books XI, XIII, XIV, XV, XVII, XXI; Virgil's *Aeneid*. The *Odyssey*, *Iliad* and *Aeneid* should be read in English translations of recognized literary excellence.

For any unit of this group a unit from any other group may be substituted.



SOUTH COLLEGE.

Group II. Shakespeare's *Merchant of Venice*; *Midsummer Night's Dream*; *As You Like It*; *Twelfth Night*; *Henry the Fifth*; *Julius Caesar*.

Group III. Defoe's *Robinson Crusoe*, Part I; Goldsmith's *The Vicar of Wakefield*; Scott's *Ivanhoe* or *Quentin Durward*; Hawthorne's *The House of the Seven Gables*; Dickens's *David Copperfield* or *A Tale of Two Cities*; Thackeray's *Henry Esmond*; Mrs. Gaskell's *Cranford*; George Eliot's *Silas Marner*; Stevenson's *Treasure Island*.

Group IV. Bunyan's *Pilgrim's Progress*, Part I; *The Sir Roger de Coverley Papers* in "The Spectator;" Franklin's *Autobiography* (condensed); Irving's *Sketch Book*; Macaulay's *Lord Clive* and *Warren Hastings*; Thackeray's *English Humourists*; selections from Lincoln, including at least the two *Inaugurals*, the *Speeches in Independence Hall* and at *Gettysburg*, the *Last Public Address*, and the *Letter to Horace Greeley*, along with a brief memoir or estimate; Parkman's *Oregon Trail*; either Thoreau's *Walden*, or Huxley's *Autobiography* and selections from *Lay Sermons*, including the addresses on *Improving Natural Knowledge*, *A Liberal Education*, and *A Piece of Chalk*; Stevenson's *An Inland Voyage* and *Travels with a Donkey*.

Group V. Palgrave's *Golden Treasury* (First Series), Books II and III, with especial attention to Dryden, Collins, Gray, Cowper, and Burns; Gray's *Elegy in a Country Churchyard* and Goldsmith's *The Deserted Village*; Coleridge's *The Ancient Mariner* and Lowell's *The Vision of Sir Launfal*; Scott's *The Lady of the Lake*; Byron's *Childe Harold*, Canto IV, and *The Prisoner of Chillon*; Palgrave's *Golden Treasury* (First Series), Book IV, with especial attention to Wordsworth, Keats and Shelley; Poe's *The Raven*, Longfellow's *The Courtship of Miles Standish*, and Whittier's *Snow-Bound*; Macaulay's *Lays of Ancient Rome* and Arnold's *Sohrab and Rustum*; Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur*; Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *Herve Riel*, *Pheidippides*, *My Last Duchess*, *Up at a Villa—Down in the City*.

LATIN.—*Grammar*: The Roman method of pronunciation is used. *Caesar*; *Commentaries*, four books, for a portion of which an equivalent in Nepos, Cicero's *De Senectute* or *De Amicitia* will be received.

Cicero: *Orations*, seven.

Virgil: *Aeneid*, six books, *Bucolics*.

Prose Composition: Daniell's or equivalent.

GREEK.—*Grammar*: Pronunciation according to the written accents and in accordance with the preface to Goodwin's *Grammar* or Hadley-Allen's, Sections 11, 14, 19, 20, 21.

Xenophon: *Anabasis*, four books for a portion of which an equivalent in *The Cyropaedia* will be received.

Homer: *Iliad* or *Odyssey*, three books; or

New Testament: *Gospels*, three.

Prose Composition: Collar and Daniell or equivalent.

GERMAN (A).—An accurate knowledge of the principles of grammar, especially the inflection of articles, adjectives, pronouns, and nouns, the conjugation of the weak and strong verbs; the uses of the modal auxiliaries; the prepositions and their government; the elementary rules of syntax and word order; to be able to read at sight ordinary German prose. It is believed that this requisite facility can be acquired by reading not less than two hundred duodecimo pages of simple German.

GERMAN (B).—This includes a thorough knowledge of accidence, of the elements of word-formation, and of the principal uses of the prepositions and conjunctions. The candidate should be familiar with the essentials of German syntax, and must possess the ability to translate into German easy English prose; to translate at sight passages from standard classical authors. The reading of at least three hundred and fifty pages in addition to that required under German (A) will develop such ability. For examination no specific authors or work are designated. Each candidate is required to bring a statement from his teacher, mentioning text-books used and authors read, including the number of pages translated.

FRENCH (A).—This embraces a thorough knowledge of the rudiments of grammar, including the inflection of the regular and the more common irregular verbs; the inflection of nouns and adjectives for gender and number; the uses of articles and partitive constructions; the forms and positions of personal pronouns; the uses of the other pronouns. Candidates should be able to read at sight ordinary modern prose. It is believed that this ability is acquired by reading two hundred duodecimo pages from the works of at least three different authors.

FRENCH (B).—Candidates should show a thorough knowledge of accidence, and a familiarity with the essentials of French syntax, especially the uses of the tenses, modes, prepositions and conjunctions. They must be able to translate into French a connected passage of simple English, and to translate at sight standard French authors. This proficiency may be acquired by reading, in addition to that required under French (A), not less than four hundred pages of the works of various standard authors. For examination no special authors or works

are designated. Applicants should present a statement from their teachers setting forth the text-books used and the number of pages translated.

PARTIAL OR SPECIAL COURSES.

In addition to the courses above specified, students may be admitted under exceptional circumstances to pursue courses of study of a special character not leading to a degree. Such students are required to undergo such preliminary examination as may be deemed necessary to ascertain their fitness to pursue the proposed course. When admitted they are subject to the same rules and regulations and the same examinations in the studies pursued as are other undergraduates. On completing their course they will receive, on application, certificates of proficiency in such studies as they have satisfactorily completed.

ADVANCED STANDING.

Candidates for advanced standing are examined not only in the preparatory studies, but also specially in the previous studies of the class they wish to enter, or their full equivalents. No certificate from a preparatory school will be accepted as a substitute for College work.

Students from another College bringing certificates of rank and honorable dismissal are permitted to recite on trial with corresponding rank in this College, until there is sufficient test of their qualifications for admission to regular standing. They will, however, be examined on whatever studies of the course may not be in the curriculum of the College from which they come, unless there are full equivalents.

No student, whether from another College or not, will

be admitted to the Senior Class as a candidate for a degree after the beginning of the second term.

CONDITIONS.

Students who fail to pass in a part of the subjects in which they are examined may be admitted upon the condition that they pass a satisfactory examination on such subjects before the end of the term next after that in which they enter. The number of such conditions with which a student is admitted to the College will be determined in each case by a vote of the Faculty.

CERTIFICATES.

Certificates of the Examination Board of the Association of Colleges and Preparatory Schools of the Middle States and Maryland, of the Regents of the University of the State of New York and of certain approved preparatory schools are received in lieu of examination for entrance. Certificates, which will be accepted only from graduates of regularly prescribed preparatory courses, must be signed by the principal and certify only to work done during school hours. They should be filed with the Registrar before the entrance examination in June. Blank certificates will be furnished upon application. Whenever the certificate does not cover one or more of the requirements of admission or supply a satisfactory equivalent, an examination upon such subject or subjects will be required. Such certificates will not be received after one year from the completion of the period of study for which they are given unless an additional certificate of continued study accompany them.

MATRICULATION.

No student is considered a regular member of the College until after his matriculation, which takes place thirty days after his entrance. During the interval between his admission and matriculation he is, however, in all respects subject to the laws of the College.

DESCRIPTION OF COURSES.

Three courses of study are offered in the Academic department leading to appropriate degrees. These courses have been carefully arranged so as to provide a thorough mental discipline and prepare the student to pursue to advantage the learned professions or to meet the requirements of a business career. The Freshman and Sophomore years are prescribed. The Junior and Senior years are half prescribed and half elective. A very wide choice of studies is provided both by the threefold arrangement of courses and by the numerous electives of the last two years. At the same time continuity and thoroughness are secured by the requirement of a large part of the curriculum.

The Technical courses are prescribed throughout. They are arranged so as to provide in the earlier years a general education of the kind that is indispensable for the successful pursuit of the engineering and chemical professions; and in the later years a thorough professional training.

Every student is expected to arrange a schedule of at least sixteen weekly exercises. These exercises are calculated on the basis of *periods*—the period being the equivalent of one recitation hour or three hours of drawing-room, laboratory, or field work. A lecture which does not require previous preparation may be combined with two hours of practical work in a *period*.

The following courses of study are offered:

CLASSICAL COURSE.

Leading to the Degree of A.B.

LATIN SCIENTIFIC COURSE.

Leading to the Degree of Ph.B.

GENERAL SCIENTIFIC COURSE.

Leading to the Degree of B.S.

CIVIL ENGINEERING COURSE.

Leading to the Degree of C.E.

MINING ENGINEERING COURSE.

Leading to the Degree of E.M.

ELECTRICAL ENGINEERING COURSE.

Leading to the Degree of E.E.

MECHANICAL ENGINEERING COURSE.

Leading to the Degree of M.E.

CHEMICAL COURSE.

Leading to the Degree of B.S. in Chemistry.

COURSE NUMBERS.

For description of courses see pages 79-127.

LANGUAGE AND LITERATURE.

- 1- 50 ENGLISH.
- 51- 70 ELOCUTION.
- 71-160 GERMAN AND ROMANCE LANGUAGES.
- 161-200 CLASSICS.
- 201-210 HEBREW.

HISTORY, POLITICAL SCIENCE, AND PHILOSOPHY.

- 221-250 BIBLE.
- 251-310 PHILOSOPHY.
- 311-350 HISTORY.
- 351-400 POLITICAL AND SOCIAL SCIENCE.

SCIENCE AND MATHEMATICS.

- 401-440 MATHEMATICS.
441-460 GRAPHICS.
461-490 PHYSICS.
491-530 GEOLOGY.
531-550 ASTRONOMY.
551-580 BIOLOGY AND HYGIENE.

CIVIL ENGINEERING.

- 601-610 SURVEYING.
611-620 RAILROADS.
621-630 MECHANICS.
631-640 ROADS AND PAVEMENTS.
641-650 MASONRY.
651-660 CEMENT AND CONCRETE.
661-670 HYDRAULICS.
671-680 SEWERAGE.
681-690 WATER SUPPLY.
691-698 ROOFS AND BRIDGES.
699-700 THESES.

MINING ENGINEERING.

- 701-710 MINE SURVEYING.
711-730 MINING METHODS.
731-740 MINING MACHINERY.
741-750 MINE ADMINISTRATION.
751-760 MINING LAW.
761-770 THESES.

ELECTRICAL ENGINEERING.

- 801-810 ELEMENTS OF ELECTRICAL ENGINEERING.
811-820 ALTERNATING CURRENTS.
821-830 ELECTRICAL LABORATORY.
831-840 POWER GENERATION.
841-850 POWER TRANSMISSION.
851-860 ELECTRICAL DESIGN.
861-870 ENGINEERING ABSTRACTS.
871-880 THE TELEPHONE.
881-890 ILLUMINATING ENGINEERING.
981-900 THESES.

CHEMISTRY.

- 901-950 CHEMISTRY.
951-960 METALLURGY.
961-970 TECHNICAL GERMAN.
971-980 THESES.

MECHANICAL ENGINEERING.

- 1001-1010 SHOP AND FOUNDRY.
1011-1020 MACHINE DESIGN.
1030-1050 ENGINES.
1060-1070 LABORATORY.

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CLASSICAL COURSE.

The Classical Course, which leads to the Degree of Bachelor of Arts, consists of the historic course in the *Arts*, or *Humanities*, and retains the regular character of that course, which has so long been regarded as the foundation of a liberal education.

As the usual preparation for the learned professions, including teaching and journalism, special regard is given to the necessities of these professions, so that in addition to being the well-tried means of securing a broad and liberal culture and an approved foundation of Christian scholarship, it is particularly fitted to prepare for the learned professions. It also affords an excellent preparation for other pursuits, including scientific and technical professions.

The instruction embraces a systematic study of the Bible and the Evidences of Christianity throughout the course, of the Ancient and Modern Languages and their literatures, together with Comparative Philology; Pure and Applied Mathematics; Physics, Chemistry, and the Natural Sciences; Rhetoric and Elocution; Logic and Metaphysics; History and Political Science, and Mental and Moral Philosophy.

SYNOPSIS OF STUDIES.

CLASSICAL COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA 2 AND SOLID GEOMETRY 2†.....	4	402 & 406
OR		
SOLID GEOMETRY‡.....	4	407

* See pages 79-127.

† Entered with Mathematics B, Division A.

‡ Entered with Mathematics A, Division B.

	Periods per week	Course number.*
GREEK.....	4	161
LATIN.....	4	181
ENGLISH.....	2	1
HYGIENE.....	1	580
THE BIBLE.....	1	221

Second Term.

ALGEBRA†.....	4	403
OR		
ALGEBRA‡.....	4	404
GREEK.....	4	162
LATIN.....	4	182
ENGLISH.....	2	2
ELOCUTION.....	1	51
THE BIBLE.....	1	222

Third Term.

TRIGONOMETRY†.....	4	412
OR		
ALGEBRA‡.....	4	405
GREEK.....	4	163
LATIN.....	4	183
ENGLISH.....	2	3
ELOCUTION.....	1	52
THE BIBLE.....	1	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY†.....	4	418
OR		
TRIGONOMETRY‡.....	4	413
GREEK.....	4	164
LATIN.....	4	184
ENGLISH.....	2	15

* See pages 79-127.

† Entered with Mathematics B, Division A.

‡ Entered with Mathematics A, Division B.

	Periods per week.	Course number.*
FRENCH.....	2	126
ELOCUTION.....	1	53
THE BIBLE.....	1	227
THEMES.		

Second Term.

PLANE AND SOLID ANALYTICAL GEOMETRY†.....	4	419
OR		
PLANE ANALYTICAL GEOMETRY‡.....	4	420
GREEK.....	4	163
LATIN.....	4	185
ENGLISH.....	2	11
FRENCH.....	2	127
ELOCUTION.....	1	54
THE BIBLE.....	1	228
THEMES.		

Third Term.

PHYSICS.....	4	461
GREEK.....	4	166
LATIN.....	2	186
FRENCH.....	2	128
GERMAN.....	3	80
CHEMISTRY.....	2	901
ELOCUTION.....	1	55
THE BIBLE.....	1	229
THEMES.		

JUNIOR YEAR.

First Term.

PHYSICS.....	4	462
GERMAN.....	3	81
ELOCUTION.....	1	56
THE BIBLE.....	1	236
THEMES.		

ELECTIVES.

MATHEMATICS.....	4	429
PHILOSOPHY.....	2	251

* See pages 79-127.

† Division A.

‡ Division B.

	Periods per week.	Course number.*
GREEK.....	2	167
GEOLOGY.....	2	491
ENGLISH A.....	4	19
CHEMISTRY.....	2	902
BIOLOGY.....	2	551
FRENCH.....	2	129
HISTORY.....	2	321
LATIN.....	2	187
BIOLOGY.....	2	571
ENGLISH B.....	4	41

Second Term.

PHYSICS.....	4	463
PHILOSOPHY.....	3	252
ELOCUTION.....	1	57
THE BIBLE.....	1	237
THEMES.		

ELECTIVES.

ENGLISH A.....	4	20
MATHEMATICS.....	4	430
GEOLOGY.....	2	492
GREEK.....	2	168
GERMAN.....	2	82
HISTORY.....	2	322
CHEMISTRY.....	2	903
HISTORY.....	2	331
FRENCH.....	2	130
LATIN.....	2	188
BIOLOGY.....	4	552
ENGLISH B.....	4	42
SPANISH.....	2	141
ITALIAN.....	2	151

Third Term.

HISTORY.....	2	351
PHILOSOPHY.....	2	254
ELOCUTION.....	1	58

* See pages 79-127.

	Periods, per week.	Course number.*
THE BIBLE.....	1	238
THEMES.		
ELECTIVES.		
ENGLISH A.....	4	21
MATHEMATICS.....	4	431
GEOLOGY.....	2	493
GREEK.....	2	169
GERMAN.....	2	83
PHYSICS.....	2	466, 469
CHEMISTRY.....	2	904
BIOLOGY.....	4	553
FRENCH.....	2	131
LATIN.....	2	189
ENGLISH B.....	4	43

SENIOR YEAR.

First Term.

ASTRONOMY.....	4	536
PHILOSOPHY.....	3	281
ELOCUTION.....	1	59
CHURCH HISTORY.....	1	242
THEMES.		

ELECTIVES.

ENGLISH A.....	4	22
HISTORY.....	2	361
PHILOSOPHY.....	2	253 or 291
PHYSICS.....	2	464, 470
CHEMISTRY.....	2	905
INTERNATIONAL LAW.....	2	376
MATHEMATICS.....	2	432
GERMAN.....	2	90 or 93
BIOLOGY.....	4	554
ENGLISH B.....	4	44
GREEK.....	2	170
FRENCH.....	2	132

* See pages 79-127.

	Periods per week.	Course number.*
GEOLOGY.....	2	494
LATIN.....	2	190
ANGLO-SAXON (optional)	1	12

Second Term.

PHILOSOPHY.....	3	302
POLITICAL ECONOMY.....	2	381
ELOCUTION.....	1	60
CHURCH HISTORY.....	1	243
THEMES.		

ELECTIVES.

HISTORY.....	2	352
MATHEMATICS.....	2	433
GERMAN.....	2	91 or 94
GEOLOGY.....	2	495
ENGLISH A.....	4	23
BIOLOGY.....	4	555
GREEK.....	2	171
FRENCH.....	2	133 or 135
LATIN.....	2	191
HEBREW.....	2	201
PHILOSOPHY.....	2	292 or 301
HISTORY OF EUROPEAN INSTITUTIONS.....	2	391
ENGLISH B.....	4	45
BLACKSTONE.....	2	371
BUSINESS LAW.....	2	372
PHYSICS.....	2	465, 467
CHEMISTRY.....	2	906
ASTRONOMY.....	2	541
HISTORY.....	2	362
ANGLO-SAXON (optional).....	1	13

Third Term.

POLITICAL ECONOMY.....	2	382
PHILOLOGY.....	3	30
ELOCUTION.....	1	61
THE BIBLE.....	1	244
THEMES.		

* See pages 71-115.

ELECTIVES.

	Periods per week.	Course number.*
HISTORY.....	2	353
MATHEMATICS.....	2	434
GERMAN.....	2	92 or 95
GEOLOGY.....	2	496
ENGLISH A.....	4	24
BIOLOGY.....	4	556
GREEK.....	2	172
FRENCH.....	2	134 or 136
LATIN.....	2	192
HEBREW.....	2	202
ENGLISH B.....	4	46
BLACKSTONE.....	2	372
PHYSICS.....	2	468
CHEMISTRY.....	2	907
ASTRONOMY.....	2	542
HISTORY.....	2	363
PHILOSOPHY.....	2	293, 303
ANGLO-SAXON (optional).....	1	14

* See pages 79-127.

PARDEE SCIENTIFIC DEPARTMENT.

This Department was organized in 1866, in accordance with the conditions of a gift from Ario Pardee, Esq., of Hazleton, Pa. The original organization has been from time to time greatly enlarged and extended largely through the continued munificence of the founder. There are at present two general courses of study Latin Scientific and the General Scientific, and four technical courses.

LATIN SCIENTIFIC COURSE.

This course, which leads to the Degree of Bachelor of Philosophy, was designed to meet the wishes of those who desire to pursue a course of liberal study without Greek. It is the same as the Classical Course except that the time devoted to the study of Greek in that course is given to the study of modern languages; great importance is paid to the study of the English language under the special direction of Professor Francis A. March, Jr.

SYNOPSIS OF STUDIES.

LATIN SCIENTIFIC COURSE.

The course of study is the same as the Classical Course except as follows:

FRESHMAN YEAR.

German 84-85-86 is substituted for Greek, four periods a week being given to this subject during the three terms.

SOPHOMORE YEAR.

The Bible is read in Latin 230-31-32 instead of Greek. English 16-17-18 and German 87-88-89 are substituted for Greek.

JUNIOR YEAR.

The Bible is read in Latin 239-40-41 instead of Greek. English History 321 is substituted for German 81. *German 91-92 are substituted for 81-3.

(For schedule of study of the Classical Course see pages 32-38.)

GENERAL SCIENTIFIC COURSE.

This course leads to the degree of Bachelor of Science, and consists of a curriculum in which Mathematics, the Modern Languages and their Literatures, especially English, and the Natural and Physical Sciences receive principal attention. It includes, however, the more general studies of the Arts Course, such as History, Logic and Rhetoric, Mental and Moral Philosophy.

The Mathematics of this course is the same as the Mathematics of the technical courses, or the Latin Scientific Course, as the student may elect upon entrance. Students electing the mathematics of the technical courses may not change unless free from conditions.

SYNOPSIS OF STUDIES.

GENERAL SCIENTIFIC COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA†.....	4	401
OR		
ALGEBRA AND SOLID GEOMETRY‡.....	4	402 & 406
ENGLISH.....	2	I

* See pages 79-127.

† Entered with Mathematics B.

‡ Entered with Mathematics A.

	Periods per week.	Course number.*
CHEMISTRY.....	4	911
DRAWING.....	2	441
GERMAN ¹	4	75
OR		
FRENCH ²	4	115
HYGIENE.....	1	580
THE BIBLE.....	1	221

Second Term.

TRIGONOMETRY†.....	5	411
OR		
ALGEBRA‡.....	4	403
ENGLISH.....	2	2
CHEMISTRY.....	2	926
GERMAN ¹	4	71
OR		
FRENCH ²	4	111
DRAWING.....	2	442
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY AND MENSURATION†.....	5	416 & 421
OR		
TRIGONOMETRY‡.....	4	412
ENGLISH.....	2	3
CHEMISTRY.....	2	927
GERMAN ²	4	72
OR		
FRENCH ¹	4	112
DRAWING.....	2	443
THE BIBLE.....	1	223

* See pages 79-127.

† Entered with Mathematics B.

‡ Entered with Mathematics A.

¹ Entered on German.

² Entered on French.

SOPHOMORE YEAR.

First Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY 2 AND DIFFERENTIAL CALCULUS 3†.....	5	417 & 426
OR		
ANALYTICAL GEOMETRY‡.....	4	418
ENGLISH.....	2	15
ENGLISH.....	2	16
CHEMISTRY.—Analytical Chemistry.....	2	928
THE BIBLE.....	1	224

Second Term.

CALCULUS†.....	5	427
OR		
ANALYTICAL GEOMETRY‡.....	4	4419
ENGLISH.....	1	17
CHEMISTRY.....	2	929
THE BIBLE.....	1	225
ANGLO-SAXON.....	2	11

Third Term.

PHYSICS.....	4	461
ENGLISH.....	4	18
BIOLOGY.....	4	561
CHEMISTRY.....	2	930
THE BIBLE.....	1	226

JUNIOR YEAR.

First Term.

PHYSICS.....	4	462
HISTORY.....	2	321
ELOCUTION.....	1	56
THE BIBLE.....	1	233

* See pages 79-127.

† Entered with Mathematics B.

‡ Entered with Mathematics A.

ELECTIVES.

	Periods per week.	Course number.*
GEOLOGY.....	2	491
ENGLISH.....	4	19
ENGLISH.....	2	41
CHEMISTRY.....	2	931
BIOLOGY.....	2	551
BIOLOGY.....	2	571
FRENCH.....	2	129
GERMAN.....	2	90-93-96

After the First Term, Junior year, the schedule of study for the General Scientific Course is the same as for the Classical Course, except that during the rest of the Junior year the Bible is read in German 234-35 instead of Greek; and German 91-2, 94-5 or 97-8 is substituted for 82-3. (For schedule of study of the Classical Course see pages 32-38.)

* See pages 79-127.

THE CIVIL ENGINEERING COURSE.

The course in Civil Engineering has been designed to develop the mental faculties of the student in those studies which form the foundation of all branches of Technology with additional training in the subjects classed as Civil Engineering. The course also includes such general subjects, essential to a liberal education, as are shown in the synopsis on pages 47-51.

The graduate is prepared for immediate usefulness in the field and office, and, after a moderate amount of professional experience, to fill positions of trust and importance, not only in his chosen profession, but in allied work in mining, mechanical, electrical and architectural engineering.

CIVIL ENGINEERING LABORATORIES AND EQUIPMENT.

The Department has a large equipment of instruments necessary for various branches of engineering field practice, including tapes, compasses, transits, levels, plane tables, barometers, standard base line tapes and pulling apparatus, sextants, solar attachments, chronometers, floats and current meters. A twelve-inch portable alt-azimuth instrument, reading to single seconds by micrometer mircoscopes, and provided with level for double zenith distances, is used for instruction in Geodesy and Practical Field Astronomy. A precision level of the latest design is employed in instruction in precise leveling. The astronomical observatory contains an equatorial

telescope, transit, clock, chronograph, meteorological instruments, etc.

For use in the lecture room there are numerous models of the various types of bridge and roof trusses; several complete sets of full-weight standard rolled sections; numerous full-weight sections of riveted joints, representing bridge and boiler work, hand and power riveting; wall charts; working drawings; photographs; slide rules; and lantern, with reflectoscope. The hydraulic lecture room is directly connected with the laboratory, and the equipment of the latter is used for demonstration purposes before the class.

The Department also has a full-weight pin-connected highway bridge of fifty feet span and fourteen feet roadway weighing twelve tons, together with all false work and tools necessary to erect the same.

The GENERAL TESTING LABORATORY contains one transverse machine of 400,000 pounds capacity for specimens up to twenty-five feet in length and four feet in width, one 200,000-pound, three 100,000-pound screw testing machines and one 60,000-pound hydraulic testing machine arranged for tension, compression and transverse testing; a 4,000-pound wire tester and a small machine for testing cord, twine, etc.; a 4,000-pound transverse machine for specimens up to sixteen feet, and a smaller transverse machine for specimens up to five feet, arranged with micrometers for measuring deflections, and extension meters for measuring fiber deformations. The laboratory also contains a torsion machine of 125,000 inch-pound capacity for specimens up to twenty feet in length and a 10,000 inch-pound torsion machine of the pendulum type for short specimens;

a number of elongation meters of different types, compressometers and smaller micrometers, hand tools, etc., and apparatus for calibrating machines. There are also a number of special apparatus for shearing, punching, bending, etc., tests.

The CEMENT LABORATORY contains three 1,000- and two 2,000-pound machines for testing cement by tensile, compressive, and transverse stress, a machine for moulding briquettes under pressure, a power-driven Boehme Hammer, a ball mill, an automatic sieving apparatus, apparatus for accelerated tests, etc. It is further equipped with large immersion tanks with running water, cement bins, briquette racks, and the necessary moulds, sieves, scales, moist closets, specific gravity apparatus, etc. It also contains a number of slate-top mixing tables, each provided with a moist closet, scales and the necessary hand tools.

The CONCRETE LABORATORY contains a large mixing floor, an immersion tank and the necessary moulds for beams up to fifteen feet in length, moulds for compression specimens, a beam crane and trucks of two tons capacity for the convenient handling of specimens, scales, sieves, measures and storage bins for stone, sand and cement.

The HYDRAULIC LABORATORY contains a vertical pressure tank eighteen feet in height and five feet in diameter, arranged for making experiments on the flow of water through orifices and nozzles under heads up to three hundred feet, and provided with a device by which the orifice plates can be removed while the tank is under pressure; other smaller tanks for use under low heads; a standpipe sixty feet high; two tanks, thirty

feet long for weir experiments and measurements of quantity; a turbine; impulse wheels; a centrifugal pump run by electric motor and provided with electric measuring instruments and transmission dynamometer; rotary disc and reciprocating water meters; a Venturimeter; a weighing tank; absolute and differential pressure gauges; and other appliances for the measuring of water used in experiments and for the testing of meters, motors, nozzles and fire hydrants; as well as arrangements for lecture-room illustrations. There is also connected with the laboratory a boiler plant and a one-million gallon Worthington duplex pump upon which tests are made.

The ROAD MATERIAL LABORATORY contains a rattler for testing paving brick; a Deval abrasion machine for testing road metal; hot oven, scales, immersion tanks, etc.

The SHOP, which is in charge of a skilled mechanic, contains two lathes, a drill press, a planer, a milling machine, a grinder and other necessary appliances for preparation of test specimens, models and apparatus and for repair work.

The LIBRARY contains the best and latest books and periodicals upon engineering subjects, and the students are encouraged to make free use of the same.

SYNOPSIS OF STUDIES.

CIVIL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911

* See pages 79-127.

	Periods per week.	Course number.*
GERMAN†.....	4	75
OR		
FRENCH‡.....	4	115
ENGLISH.....	2	I
DRAWING AND LETTERING.....	2	441a-442a
THE BIBLE.....	I	221
HYGIENE AND PHYSICAL CULTURE.....	I	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	926
GERMAN†.....	4	71
OR		
FRENCH‡.....	4	111
ENGLISH.....	2	2
DRAWING AND LETTERING.....	2	441b-442b
THE BIBLE.....	I	222

Third Term.

ANALYTICAL GEOMETRY.....	3	416
MENSURATION AND LOGARITHMS.....	2	421
CHEMISTRY.....	2	927
GERMAN†.....	4	72
OR		
FRENCH‡.....	4	112
ENGLISH.....	2	3
DRAWING AND PROJECTIONS.....	2	441c-442c
SURVEYING.....	2	601
THE BIBLE.....	I	223
SUMMER SCHOOL IN SURVEYING (in vacation).		
Three weeks.....		602

SOPHOMORE YEAR.

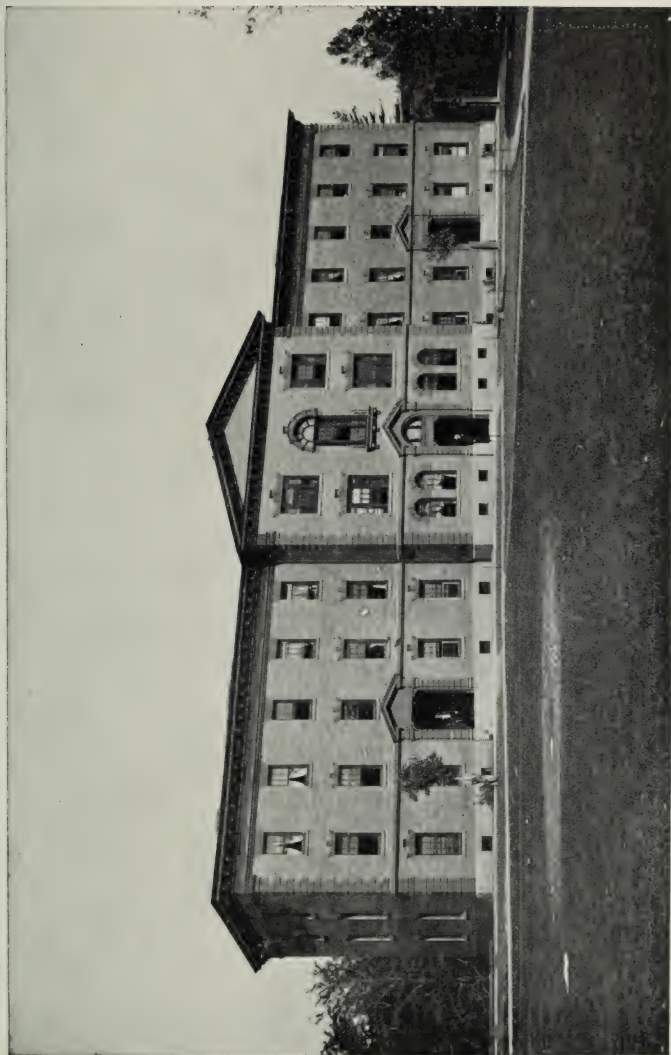
First Term.

ANALYTICAL GEOMETRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426

* See pages 79-127.

† Entered on German.

‡ Entered on French.



MARTIEN, FAYERWEATHER AND POWELL HALLS.

	Periods per week.	Course number.*
PHYSICS.....	4	461
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451a
SURVEYING.....	2	603
SHOP WORK.....	2	1001-02
THE BIBLE.....	1	224
THEME.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
PHYSICS.....	4	462
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451b
RAILROADS.....	2	611
SHOP WORK.....	2	1003-04
THE BIBLE.....	1	225
THEME.		

Third Term.

ENGLISH.....	2	4
PHYSICS.....	4	463
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451c
MACHINE DRAWING.....	1 $\frac{1}{3}$	452
APPLIED MECHANICS.....	4	622
RAILROADS.....	2	612
SHOP WORK.....	2	1004
THE BIBLE.....	1	226
SUMMER SCHOOL IN SURVEYING (in vacation).		
Three weeks.....		613
THEME.		

JUNIOR YEAR.

First Term.

METALLURGY.....	2	951
CRYSTALLOGRAPHY.....	2	511
APPLIED MECHANICS.....	4	623
RAILROADS.....	3	614
MECHANICS OF MATERIALS.....	4	624

* See pages 79-127.

	Periods per week.	Course number.*
CEMENT.....	2	651
PRACTICAL ELECTRICITY.....	2	804
THE BIBLE.....	1	233
THEME.		

Second Term.

STEAM ENGINE.....	4	476
PETROGRAPHY.....	2	512
SPANISH (optional).....	2	141
ITALIAN (optional).....	2	151
MECHANICS OF MATERIALS.....	4	625
PRACTICAL ELECTRICITY.....	2	805
CONCRETE.....	2	652
RAILROADS.....	2	615
ROADS AND PAVEMENTS.....	2	631
THE BIBLE.....	1	234
THEME.		

Third Term.

MINERALOGY (systematic).....	2	513
SANITARY BIOLOGY.....	2	561
SPANISH (optional).....	2	142
ITALIAN (optional).....	2	152
CONCRETE, REINFORCED.....	2	653
RAILROADS.....	2	616
MASONRY.....	2	641
HYDRAULICS.....	3	661
FRAMED STRUCTURES.....	2	690
THE BIBLE.....	1	235
THEME.		

SENIOR YEAR.

First Term.

GENERAL GEOLOGY.....	2	516
DESCRIPTIVE ASTRONOMY.....	2	531
ROOFS AND BRIDGES.....	2	691
ROOF DESIGN.....	1	694
GRAPHIC STATICS.....	1	698
HYDRAULICS.....	3	666

* See pages 79-127.

	Periods per week	Course number.*
MASONRY DESIGN.....	2	642
SEWERAGE.....	2	671
THE BIBLE.....	1	242
THEME.		

Second Term.

POLITICAL ECONOMY.....	2	381
GENERAL GEOLOGY.....	2	517
PRACTICAL ASTRONOMY.....	2	541
ROOFS AND BRIDGES.....	4	692
BRIDGE DESIGN.....	2	695
SEWERAGE DESIGN.....	2	672
WATER SUPPLY.....	3	681
PARK ENGINEERING.....	2	683
THE BIBLE.....	1	243
THEME.		

Third Term.

PRACTICAL ASTRONOMY.....	2	542
ROOFS AND BRIDGES.....	3	693
BRIDGE DESIGN.....	5	696
BRIDGE ERECTION.....	(two days)	697
WATER SUPPLY DESIGN.....	2	682
THESIS.....	2	699
THE BIBLE.....	1	244

* See pages 79-127.

THE MINING ENGINEERING COURSE.

The aim of this course is to provide a good education, to lay a sound foundation in Engineering, and to give special preparation in Mining, Geology, Chemistry, Metallurgy, and Assaying.

Courses in Surveying, Analytical Mechanics, Mechanics of Materials, Materials of Construction, Laboratory Physics, and Railroad Engineering are given.

The courses in Mathematics, Languages, Physics, and Pure Graphics are the same in all the Engineering Departments.

A course in the Theory of Steam Engineering is followed by Graphical Constructions and Computations.

In Mechanical Engineering, after the course in Analytical Mechanics, Mechanics of Materials, Materials of Construction, and Graphic Statics, a term of Machine Design and Construction is given.

Three terms of Shop work, including wood-turning, pattern-making, forging, foundry and machine shop work, are given.

In Surveying, the theory and practice extends through first and third years, and includes: Chain, Compass and Transit Surveying; Adjustment of Instruments; Leveling; City Surveying; Topographical Surveying; Railroad Reconnaissance, Location, and Construction, with Profile Plans, Earthwork Calculation, Bills, of Material, Estimates, Specifications, and Contracts; Theory of Mine Surveying, and the actual survey of a mine.

Following the course in Electricity as given in Physics, two periods each week for two terms are devoted to the study of Electrical Machinery with selected laboratory work, having especial reference to the application of electricity to mining operations.

The course in Drawing includes: Elements of Mechanical Drawing, tracings and blue prints; Free-hand Drawing and Lettering; Descriptive Geometry; Topographical Drawing; Graphic Statics; Map Drawing; Machine Drawing and Design. Additional drawing is also required in connection with mining problems.

The work in Chemistry begins with the first term of the Freshman year, and continues, without any break, for two years. Lectures and text-book study are accompanied by recitations and laboratory practice.

Metallurgy is given in the Junior year, and embraces the metallurgy of iron, steel, gold, silver, copper, lead, zinc, etc. Thorough courses are also given in Assaying and Blowpiping.

Particular stress is laid on a thorough course in English, which extends over the first two years. Both German and French are studied during the first year. Two periods each week for one term are devoted to the study of Political Economy. A theme written on some assigned technical subject is required of the student each term.

In addition to the courses in Mineralogy and Geology, as previously explained, the mining engineers are given a course of two hours each week for one term in the study of Ore Deposits, and a course of the same length is given in Field Geology. Instruction in the classroom will be supplemented, so far as possible, by a study

of the different kinds of ore, and of the "country rock" in which they occur. A special course in the modern methods of determining rocks in thin sections by means of the polarizing microscope, with instruction in the proper methods of preparing and mounting the sections, will be offered; and practice in the ordinary methods of field work in geology, with the mapping and sectioning of a certain region, will be given.

The course in Mining proper begins with the Theory of Mine Surveying and the solution of problems for determining the position of faulted ore bodies. Then follows Prospecting for ore deposits in lodes, beds, and placers; Prospecting for magnetite with the magnetic needle, and borings for water, oil and gas. The study of Rope, Rod, and Diamond Drill Boring is followed by that of Blasting and Excavation. In this connection the various tools, machines, and explosives are studied, together with their application in Blasting and Quarrying. Shaft Sinking, Shaft Boring, and Tunneling are studied, together with the materials for the support of excavated spaces and the methods of their application. While all the methods of Exploitation are investigated, particular attention is given to the mining of soft ore bodies, and of anthracite and bituminous coal. In the treatment of Haulage and Winding, special consideration is also given to the requirements of coal mining. Prominence is given to the study of Ventilation and Lighting because of their great importance in coal mining. The subject of Drainage receives careful treatment. Mining law is studied with reference to locations on public lands, and also with reference to the prevention of mine accidents. The Mechanical Separation of

Ores is studied, and designs and reviews of Special Mining Operations are made. The principles involved in determining the values of Mines and Quarries are discussed.

The Mining Engineering students use a separate room as a study. This is provided with an excellent Mining Library, and is supplied with the leading Mining periodicals. By the aid of a topical index, and card catalogue the library is regularly used in the study of the subjects assigned. The student is in this way led to many original sources for information, and becomes acquainted with the prominent works on Mining.

Magnetite, hematite, and limonite iron mines are close at hand, and the anthracite coal mines and zinc mines are easily accessible; these, with extensive quarries of slate, limestone, steatite, granite, serpentine, and sandstone in the vicinity, offer excellent opportunities for the study of mining and quarrying operations.

The Ingersoll-Rand Company, one of the largest manufacturers of mine machinery in the world, is located near Easton. This gives the Mining students the opportunity of seeing the construction of important mine machinery and of testing the machines.

Frequent visits are made to the mines and quarries in the vicinity, and two weeks in the spring vacation are spent at some prominent mining region in the practice of Mine Surveying and in the study of Practical Mining. Students are strongly advised to spend at least one summer vacation during their course in actual work at the mines.

Attendance at the first session of the Summer School of Surveying is required of all Mining Engineering stu-

dents, and attendance at the second session is strongly recommended.

The students in Mining Engineering have the privilege of electing additional work in Chemistry, Metallurgy or Mining Geology.

MINING ENGINEERING EQUIPMENT.

In Mechanics and Mechanics of Materials, work is given in the GENERAL TESTING LABORATORY. In Hydraulics, the Mining students make tests in the HYDRAULIC LABORATORY. Laboratory work in Assaying and Metallurgy is given in laboratories connected with the CHEMICAL LABORATORY.

There is a separate Mine Department Library and Reading room, which contains a large Mining Library and is supplied with the leading Mining periodicals.

There is connected with the Department a distinct mine drafting and construction room, and a dark-room for photography and blue-printing.

The Department is equipped with two mine transits, large mine level, aneroid barometers, solar attachments, anemometers, etc., and all the accessory instruments necessary for two complete mine survey outfits.

A projecting lantern with about 1000 slides is used in illustrating lectures. New slides are added each year.

The Department possesses maps, charts, models, photographs, sample collections of ores, small machines and machine parts, working drawings with bills of material, trade catalogues, etc.

ORE DRESSING MILL. The mine laboratory is equipped with a small concentrating plant to demonstrate to the mining students all the principles involved in the con-

centration of ores. The model mill embodies every feature of a modern concentrating mill.

The equipment includes a Blake crusher, 3 sets of Cornish belt-driven Rolls, an ore feeder, Elevators, Trommels, 3 five-compartment New Century differential motion Jigs, Concentrating table, round Buddle, Hydraulic Classifier, Spitzkasten and a $1\frac{1}{2}$ in. Centrifugal Pump together with all necessary ore bins, shafting, pulleys, belting, etc.

SYNOPSIS OF STUDIES.

MINING ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911
GERMAN†.....	4	75
OR		
FRENCH‡.....	4	115
ENGLISH.....	2	1
DRAWING AND LETTERING.....	2	441a-442a
THE BIBLE.....	1	221
HYGIENE AND PHYSICAL CULTURE.....	1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	926
GERMAN†.....	4	71
OR		
FRENCH‡.....	4	111
ENGLISH.....	2	2
DRAWING AND LETTERING..	2	441b-442b
THE BIBLE.....	1	222

* See pages 79-127.

† Entered on German.

‡ Entered on French.

Third Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY.....	3	416
MENSURATION AND LOGARITHMS.....	2	421
CHEMISTRY.....	2	927
GERMAN†.....	4	72
OR		
FRENCH†.....	4	112
ENGLISH.....	2	3
DRAWING AND PROJECTIONS.....	2	441C-442C
SURVEYING.....	2	601
THE BIBLE.....	1	223
SUMMER SCHOOL IN SURVEYING (in vacation).		
Three weeks... ..		602

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
CHEMISTRY.....	2	928
PHYSICS.....	4	461
SHOP WORK.....	2	1001-02
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2 ¹ / ₃	451a
THE BIBLE.....	1	224
THEME.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
CHEMISTRY.....	2	929
PHYSICS.....	4	462
SHOP WORK.....	2	1003-04
ENGLISH.....	1	4
DESCRIPTIVE GEOMETRY.....	2 ¹ / ₃	451b
THE BIBLE.....	1	225
THEME.		

* See pages 79-127.

† Entered on German.

‡ Entered on French.

Third Term.

	Periods per week.	Course number.*
APPLIED MECHANICS.....	4	622
CHEMISTRY.....	2	930
PHYSICS.....	4	463
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451C
MACHINE DRAWING.....	1 $\frac{1}{3}$	452
SHOP WORK.....	2	1004
ENGLISH.....	2	4
THE BIBLE.....	1	226
THEME.		

JUNIOR YEAR.

First Term.

DIFFERENTIAL EQUATIONS AND LEAST SQUARES.	2	437
APPLIED MECHANICS.....	4	623
MECHANICS OF MATERIALS.....	4	624
MINING (Prospecting).....	2	711
ELECTRICAL ENGINEERING.....	2	821
METALLURGY.....	2	951
CRYSTALLOGRAPHY.....	2	511
SURVEYING.....	2	604
THE BIBLE.....	1	233
THEME.		

Second Term.

MECHANICS OF MATERIALS.....	3	627
STEAM ENGINE.....	4	476
METALLURGY.....	2	952
ELECTRICAL ENGINEERING.....	2	822
PETROGRAPHY.....	2	512
SPANISH (optional).....	2	141
ITALIAN (optional).....	2	151
MINE SURVEYING.....	2	701
THE BIBLE.....	1	234
THEME.		
SPRING VACATION MINING TRIP.		

* See pages 79-127.

Third Term.

	Periods per week.	Course number.*
MECHANICS OF MATERIALS.....	3	628
MINERALOGY (Systematic).....	2	513
MINE ENGINEERING (Blasting and Quarrying)....	2	712-713
HYDRAULICS.....	3	661
METALLURGY.....	2	952
SPANISH (optional).....	2	142
ITALIAN.....	2	152
MAP OF MINE SURVEY.		
RAILROADS.....	2	611
THE BIBLE.....	1	235
THEME.		

SENIOR YEAR.

First Term.

GENERAL GEOLOGY.....	2	516
HYDRAULICS.....	3	663
MACHINE DESIGN.....	2	1022
MINE CONSTRUCTION.....	2-3	719
MINING (Shaft Sinking, Drifting and Tunneling).	2	714
MINING (Exploitation).....	2	715
THE BIBLE.....	1	242
THEME.		

ELECTIVES.

MINING GEOLOGY.....	2	523
ANALYTICAL CHEMISTRY.....	2	953
MINING.....	2	721

Second Term.

GENERAL GEOLOGY.....	2	517
ASSAYING.....	2	955
POLITICAL ECONOMY.....	2	381
MINING LAW.....	2	751
MINING (Transportation).....	2	716
MINING (Ventilation and Lighting).....	2	717
MINING (Construction).....	2	752
THE BIBLE.....	1	243
THEME.		

* See pages 79-127.

ELECTIVES.

	Periods per week	Course number.*
MINING GEOLOGY.....	2	524
ANALYTICAL CHEMISTRY.....	2	954
MINING.....	2	722

Third Term.

MINING GEOLOGY (Field Geology).....	2	522
MINING GEOLOGY (Economic Geology).....	2	521
MINE ADMINISTRATION.....	2	741
MINING (Mine Drainage).....	3	718
MINING (Construction).....	2	752
ANALYTICAL CHEMISTRY (Elective).....	2	954
ORE DRESSING.....	4	720
THE BIBLE.....	1	244
GRADUATION THESIS.		761

* See pages 79-127.

THE ELECTRICAL ENGINEERING COURSE.

The object of the course in Electrical Engineering is to give thorough instruction in such branches of engineering, both general and electrical, as shall fit the graduate to successfully meet and solve the problems which come to him as a practicing electrical engineer. To this end, stress is laid on the attainment of a broad engineering and scientific training rather than on the specialization along any particular line or lines of Electrical Engineering. The aim is to train neither specialists nor artisans, but to give such instruction as shall enable the engineer to build up from the foundation of his knowledge of basic principles such specialized knowledge or reasoning as may be required to successfully meet the problem arising for solution.

The Freshman and Sophomore years are devoted to general instructional and culture courses. Thorough training is given in Mathematics, and Physics is taken throughout the Sophomore year, additional hours in elementary electricity and magnetism being given to the students from the Department of Electrical Engineering, so that they may be especially prepared to take up successfully their particular line of training during the last two years of their course.

Beginning with the Junior year, the fundamental principles of Electrical Engineering are studied in the class-room and worked out in the laboratory, the design room, and in problem work. The aim has been to so

arrange these several lines that they shall be mutually supplemental and thus give the student a clear, general conception of the principles involved, their correlation and relative importance.

This plan is continued throughout the Senior year as well, attention now being paid to the direct application of the theories and principles thus arrived at, to the various phases of present-day commercial practice, consideration being given to the financial and commercial as well as the engineering side.

The graduate is in this way prepared to take up in an effective and intelligent manner any branch of electrical engineering requiring general or special electrical training.

ELECTRICAL ENGINEERING LABORATORIES AND EQUIPMENT.

The laboratories are large and well arranged. The main electrical laboratory is thirty by sixty feet in dimensions, and is fitted up with representative types of continuous and alternating generators and motors, lamp-banks, water rheostats, brakes, etc.; and the necessary instruments are supplied for loading and testing generators and motors.

The laboratories are supplied from the Easton Power Company's station, with two-phase alternating current, at a frequency of sixty cycles. This current is available for testing purposes.

A fifty kilowatt motor-generator set has recently been installed for the purpose of supplying the laboratories with direct current. This set consists of a seventy-five horse power induction motor, directly connected to two twenty-five-kilowatt, 120-volt direct current

dynamos, the current from which is supplied to the laboratories by means of the three-wire system.

In case of need, direct current from the plant of the Easton Power Company is also available.

While designed primarily as a source of direct current, this motor-generator set is so installed as to be available at all times for experimental test by the students.

A portion of the laboratories is fitted up for the more delicate tests required. This consists of two rooms, each being about twenty-two feet square, containing the necessary instruments for accurate testing, among which are a Leeds and Northrup Potentiometer, a Thompson Quadrant Electrometer, D'Arsonval Galvanometers, Wheatstone Bridges, Condensers, etc.

SYNOPSIS OF STUDIES.

ELECTRICAL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number *
ALGEBRA.....	4	401
CHEMISTRY.....	4	911
GERMAN†.....	4	75
OR		
FRENCH‡.....	4	115
ENGLISH.....	2	I
DRAWING AND LETTERING.....	2	441a-442a
THE BIBLE.....	1	221
HYGIENE AND PHYSICAL CULTURE.....	1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	926

* See pages 79-127.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
GERMAN†.....	4	71
OR		
FRENCH‡.....	4	111
ENGLISH.....	2	2
DRAWING AND LETTERING.....	2	441 ^b 442 ^b
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY.....	3	416
MENSURATION AND LOGARITHMS.....	2	421
CHEMISTRY.....	2	927
GERMAN†.....	4	72
OR		
FRENCH‡.....	4	112
ENGLISH.....	2	3.
DRAWING AND PROJECTIONS.....	2	441 ^c 442 ^c
SURVEYING.....	2	601
THE BIBLE.....	1	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
SHOP WORK.....	2	1001-02
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2 ¹ / ₃	451 ^a
PHYSICS.....	6	461, 464
THE BIBLE.....	1	224
THEME.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
SHOP WORK.....	2	1003-04
		1003

* See pages 79-127.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
ENGLISH.....	2	4
PHYSICS.....	6	462, 465
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451b
THE BIBLE.....	1	225
THEME.		

Third Term.

ENGLISH.....	2	4
SHOP WORK.....	2	1004
APPLIED MECHANICS.....	4	472
PHYSICS.....	6	463, 466
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451c
MACHINE DRAWING.....	1 $\frac{1}{3}$	452
THE BIBLE.....	1	226
THEME.		

JUNIOR YEAR.

First Term.

APPLIED MECHANICS.....	4	473
DIFFERENTIAL EQUATIONS.....	2	437
ELECTRICAL LABORATORY.....	2	821
ELEMENTS OF ELECTRICAL ENGINEERING.....	5	801
ALTERNATING CURRENTS.....	2	811
THE BIBLE.....	1	233
THEME.		

Second Term.

THERMODYNAMICS.....	4	476
MECHANICS OF MATERIALS.....	3	627
ELECTRICAL LABORATORY.....	2	822
ELEMENTS OF ELECTRICAL ENGINEERING.....	4	802
ALTERNATING CURRENTS.....	2	812
SPANISH (optional).....	2	141
ITALIAN (optional).....	2	151
THE BIBLE.....	1	234
THEME.		

Third Term.

HYDRAULICS.....	3	661
MECHANICS OF MATERIALS.....	3	628
ELECTRICAL LABORATORY.....	2	823

* See pages 79-127.

	Periods per week.	Course number.*
ELEMENTS OF ELECTRICAL ENGINEERING.....	5	803
ALTERNATING CURRENTS.....	2	813
SPANISH (optional).....	2	142
ITALIAN (optional).....	2	151
THE BIBLE.....	1	235
THEME.		

SENIOR YEAR.

First Term.

HYDRAULICS.....	3	663
MOTOR ENGINEERING.....	2	815
ELECTRICAL LABORATORY.....	2	824
ALTERNATING CURRENT CIRCUITS.....	3	814
ELECTRICAL POWER TRANSMISSION.....	3	841
ELECTRICAL DESIGN.....	2	851
ENGINEERING ABSTRACTS.....	1	861
THE BIBLE.....	1	242
THEME.		

Second Term.

POLITICAL ECONOMY.....	2	381
BUSINESS LAW.....	2	372
ELECTRICAL LABORATORY.....	2	825
ELECTRICAL POWER STATIONS.....	4	831
HYDRO-ELECTRIC ENGINEERING.....	3	832
ELECTRICAL DESIGN.....	2	852
ENGINEERING ABSTRACTS.....	1	862
THE BIBLE.....	1	234
THEME.		

Third Term.

THE TELEPHONE.....	3	871
ELECTRICAL LABORATORY.....	2	826
ILLUMINATING ENGINEERING.....	3	881
ENGINEERING ABSTRACTS.....	1	863
ELECTRICAL RAILWAY ENGINEERING.....	4	842
THESIS.....	2	861
THE BIBLE.....	1	244
GRADUATION THESIS.		

* See pages 79-127.

THE MECHANICAL ENGINEERING COURSE.

The course in Mechanical Engineering will be open to all members of the Freshman class and of the present Sophomore class who are taking an Engineering course. In four years time it is not possible to turn out a finished expert in any branch of scientific work, but it is possible to give the student a thorough ground work in the fundamental principles of engineering, a groundwork which will enable him to adapt himself to any branch of the work which he may take up after graduation, and to acquire rapidly the proficiency which only comes from experience. The object of the course is not merely to train the student as an engineer, for the man who fills the position of responsibility must be able to meet other men of other walks of life on an equal footing of broad general education and culture, and for this reason there will be included in the course in Mechanical Engineering as large a proportion of cultural subjects as is compatible with a thorough understanding of the theory and application of engineering principles. The primary object of the course is to turn out a man of such broad mental development that he shall possess to the fullest extent the power of continued growth and development after he leaves his college environment.

EQUIPMENT.

It is expected that the new building, which is to be erected for the laboratories of this department will be ready for use at the beginning of the next year (September,

1911). In this building ample space will be provided for an Engineering Laboratory together with a pattern shop, foundry, forge, and machine shop. The details of construction and equipment cannot be given at this time, but it is the intention to equip the building as rapidly as possible with the best and most modern machinery. The fact that the department is newly organized will insure that the apparatus will be of the most recent design, and that the usefulness of the laboratories will not be handicapped by the presence of obsolete or semi-obsolete material. The library is already well equipped with works on all branches of Mechanical Engineering, together with the leading periodicals.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911
GERMAN	4	75
OR		
FRENCH.....	4	115
ENGLISH.....	2	1
DRAWING AND LETTERING.....	2	441a-442a
BIBLE.....	1	221
HYGIENE AND PHYSICAL CULTURE.....	1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	926
GERMAN.....	4	76
OR		
FRENCH.....	4	116
ENGLISH.....	2	2
DRAWING AND LETTERING.....	2	441b-442b
ELEMENTARY STEAM ENGINEERING.....	2	1030
BIBLE.....	1	222

* See pages 79-127.

Third Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY.....	3	416
MENSURATION AND LOGARITHMS.....	2	421
CHEMISTRY.....	2	927
GERMAN.....	4	71
OR		
FRENCH.....	4	111
ENGLISH.....	2	3
DRAWING AND PROJECTIONS.....	2	441c-442c
ELEMENTARY STEAM ENGINEERING.....	2	1030
BIBLE.....	1	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL CHEMISTRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
PHYSICS.....	4	461
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451a
METALLURGY.....	2	951
SHOP WORK.....	2	1001
	2	1002
BIBLE.....	1	224

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
PHYSICS.....	4	462
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451b
MECHANISM.....	2	1010
SHOP WORK.....	2	1003, 1004
BIBLE.....	1	225

Third Term.

ENGLISH.....	2	4
PHYSICS.....	4	463
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451c
MACHINE DRAWING.....	1 $\frac{1}{3}$	452
APPLIED MECHANICS.....	4	622

* See pages 79-127.

	Periods per week.	Course number.*
MECHANISM	2	1010
MECHANISM DRAWING	1	1011
SHOP WORK	2	1004
BIBLE	1	226

JUNIOR YEAR.

First Term.

APPLIED MECHANICS	4	623
MECHANICS OF MATERIALS	4	624
ELECTRICITY	2	804
ELECTRICAL LABORATORY	2	821
MECHANISM DRAWING	2	1011
MACHINE DESIGN	3	1020
BIBLE	1	233

Second Term.

MECHANICS OF MATERIALS	4	625
ELECTRICITY	2	805
ELECTRICAL LABORATORY	2	822
MACHINE DESIGN	3	1020
MACHINE DESIGN DRAWING	2	1021
THERMODYNAMICS	4	1035
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
BIBLE	1	234

Third Term.

TESTING LABORATORY (Mechanics of Materials) ..	1	628
HYDRAULICS	3	661
FRAMED STRUCTURES	2	690
ELECTRICAL LABORATORY	2	823
MACHINE DESIGN	3	1020
MACHINE DESIGN DRAWING	2	1021
THERMODYNAMICS	2	1035
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
BIBLE	1	235

*See pages 79-127.

SENIOR YEAR.

First Term.

	Periods per week.	Course number.*
GRAPHIC STATICS.....	1	698
HYDRAULICS.....	3	662
ROOFS AND BRIDGES.....	2	691
MACHINE DESIGN DRAWING.....	3	1021
ENGINEERING LABORATORY.....	2	1060
BOILERS.....	3	1041
HEAT ENGINES.....	3	1040
BIBLE.....	1	242

Second Term.

POLITICAL ECONOMY.....	2	381
STEAM ENGINEERING, CALCULATION.....	1	1043
STEAM ENGINEERING, DRAWING.....	3	
ENGINEERING LABORATORY.....	2	1060
VALVE GEARS.....	2	1042
HEAT ENGINES.....	3	1040
POWER PLANTS.....	4	1050
BIBLE.....	1	243

Third Term.

STEAM ENGINEERING, CALCULATIONS.....	1	1043
STEAM ENGINEERING, DRAWING.....	3	
ENGINEERING LABORATORY.....	2	1060
HEAT ENGINES.....	3	1040
POWER PLANTS.....	4	1050
HEATING AND VENTILATING.....	3	1070
BIBLE.....	1	244
GRADUATION THESIS.		

*See pages 79-127.

THE CHEMICAL COURSE.

The aim of this course, which leads to the Degree of Bachelor of Science in Chemistry, is to fit young men for practical work in chemistry, either as chemists in iron and steel works, in manufacturing establishments, or as chemical manufacturers. Great attention is paid to analytical chemistry, and especially to the chemistry of cement and the chemistry and metallurgy of iron and steel. Graduates are fitted to take paid positions as chemists immediately upon graduation. For men of the proper character immediate and remunerative employment can be secured. This course will also be found an excellent preparation for the study of medicine.

Those who take the Chemical course receive the same instruction in mathematics, drawing, shop-work, modern languages, physics and elementary chemistry up to and including elementary quantitative analysis during Freshman and Sophomore years.

During Junior and Senior years the courses diverge. Those especially interested in metallurgy and in the chemistry of cement and ceramics, receive most of their instruction from Professors Hart and Wysor.

Those interested in Organic Chemistry are in charge of Professor Hart and Mr. Hess. Those interested in Physical Chemistry are instructed by Mr. De Long with the coöperation of Professor Gordon, of the Department of Physics. Those who expect to be chemical Engineers are advised by Professors Hart and Wysor with the

assistance of Professor Rood, of the Engineering Department, while those interested in tanning will receive instruction from Professor Hart and Mr. Taylor with the coöperation of Professor Davison, of the Department of Biology.

Provision is made for new courses as the need arises. This is possible because the instruction is mainly individual and suited to the needs of each student.

While the instruction centers in the two branches of Chemistry and Metallurgy, the course aims to supply a thorough education along the lines most necessary for a successful career as a responsible chemist.

CHEMICAL AND METALLURGICAL LABORATORIES AND EQUIPMENT.

The Chemical and Metallurgical laboratories are contained in Gayley Hall, a new fire-proof structure built for the use of this Department. There are four large and four smaller laboratories and a shop, besides three stock rooms, two balance rooms, a quiz room, a lecture room, a room containing the museum and the books of the Henry W. Oliver Chemical and Metallurgical Library, and three rooms for instructors.

The two balance rooms adjoin the quantitative laboratory and one of them may be entered from the qualitative laboratory.

The four large laboratories each have desk room for 48 students. Water and gas are supplied to each student, and each room is supplied with air blast and electric current. They are well lighted, and heated by steam. The smaller laboratories are arranged for assaying, industrial work, gas analysis, microscopic and photo-

graphic work, and various other determinations made with the polariscope, spectroscope, calorimeter, etc. For this and other work properly belonging to the department, there is an adequate equipment.

SYNOPSIS OF STUDIES.

CHEMICAL COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911
GERMAN†.....	4	75
OR		
FRENCH‡.....	4	115
ENGLISH.....	2	1
DRAWING AND LETTERING.....	2	441a-442a
THE BIBLE.....	1	221
HYGIENE AND PHYSICAL CULTURE.....	1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	912
GERMAN†.....	4	71
OR		
FRENCH‡.....	4	111
ENGLISH.....	2	2
DRAWING AND LETTERING.....	2	441b-442b
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY.....	3	416
MENSURATION AND LOGARITHMS.....	2	421
CHEMISTRY.....	4	913

* See pages 79-127.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
GERMAN†.....	4	72
OR		
FRENCH‡.....	4	112
ENGLISH.....	2	3
DRAWING AND PROJECTIONS.....	2	441c-442c
THE BIBLE.....	1	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
CHEMISTRY.....	4	914
ENGLISH.....	2	4
PHYSICS.....	4	461
SHOP WORK.....	2	1001-02
THE BIBLE.....	1	224
THEMES.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
CHEMISTRY.....	4	915
PHYSICS.....	4	462
ENGLISH.....	1	5
SHOP WORK.....	2	1003-04
THE BIBLE.....	1	225
THEMES.		

Third Term.

CHEMISTRY.....	4	916
PHYSICS.....	4	463
CHEMICAL ARITHMETIC.....	4	917
SHOP WORK.....	2	1004
THE BIBLE.....	1	226
THEMES.		

* See pages 79-127.

† Entered on German.

‡ Entered on French.

JUNIOR YEAR.

First Term.

	Periods per week.	Course number.*
CRYSTALLOGRAPHY.....	2	511
QUANTITATIVE ANALYSIS.....	5	918
THEORETICAL CHEMISTRY.....	2	919
ORGANIC CHEMISTRY.....	3	920
METALLURGY.....	2	951
TECHNICAL GERMAN.....	1	961
BIBLE.....	1	233
THEMES.		

Second Term.

PETROGRAPHY.....	2	512
QUANTITATIVE ANALYSIS.....	5	931
THEORETICAL CHEMISTRY.....	2	925
ORGANIC CHEMISTRY.....	3	921
METALLURGY.....	2	952
TECHNICAL GERMAN.....	1	962
SPANISH (optional).....	2	141
ITALIAN (optional).....	2	151
BIBLE.....	1	234
THEME.		

Third Term.

QUANTITATIVE ANALYSIS.....	4	932
THEORETICAL CHEMISTRY.....	2	925
ORGANIC CHEMISTRY.....	4	922
MINERALOGY.....	3	513
SANITARY BIOLOGY.....	2	561
TECHNICAL GERMAN.....	1	963
SPANISH (optional).....	2	142
ITALIAN (optional).....	2	152
BIBLE.....	1	235
THEME.		

SENIOR YEAR.

First Term.

QUANTITATIVE ANALYSIS.....	10	933
CHEMICAL TECHNOLOGY.....	2	934

* See pages 79-127.

	Periods per week.	Course number.*
GEOLOGY.....	2	516
TECHNICAL GERMAN.....	1	964
BIBLE.....	1	242

Second Term.

ANALYTICAL CHEMISTRY (Thesis Work).....	6	971
CHEMICAL TECHNOLOGY.....	2	935
ASSAYING.....	2	955
GEOLOGY.....	2	517
ECONOMIC GEOLOGY.....	2	521
POLITICAL ECONOMY.....	2	381
TECHNICAL GERMAN.....	1	965
BIBLE.....	1	243
THEME.		

Third Term.

ANALYTICAL CHEMISTRY (Thesis Work).....	12	972
ECONOMIC GEOLOGY.....	2	521
TECHNICAL GERMAN.....	1	966
BIBLE.....	1	244

* See pages 79-127.

COURSES.

ENGLISH LANGUAGE, ENGLISH LITERATURE,
COMPARATIVE PHILOLOGY.

Professors Francis A. March (Prof. Emeritus), F. A. March, Jr., J. W. Tupper, and Messrs. Barrick, Kaufman and Browne.

The work in this department aims first, to train the student in speaking and writing English correctly. This training begins with the theme work in the Freshman year and is continued throughout the course.

The work in the upper classes is divided into the study of the language and the study of the literature. Its purpose is the interpretation of masterpieces, the re-thinking of the thoughts of master minds. The study of the language consists of a study of the principles of grammar, rhetoric, etymology, phonetics, prosody, and other material of philological investigation according to the progressive course outlined in Dr. March's *Method of Philological Study of the English Language* and the application of the results of such work to the text of some standard author. Bunyan, Spenser, Chaucer, Shakespeare, Bacon and Milton are taken up in this way, and courses in fiction, and the drama are given associated with an examination of the language of some novel or play. This course ends with the study of Dr. Whitney's *Lectures on Language*.

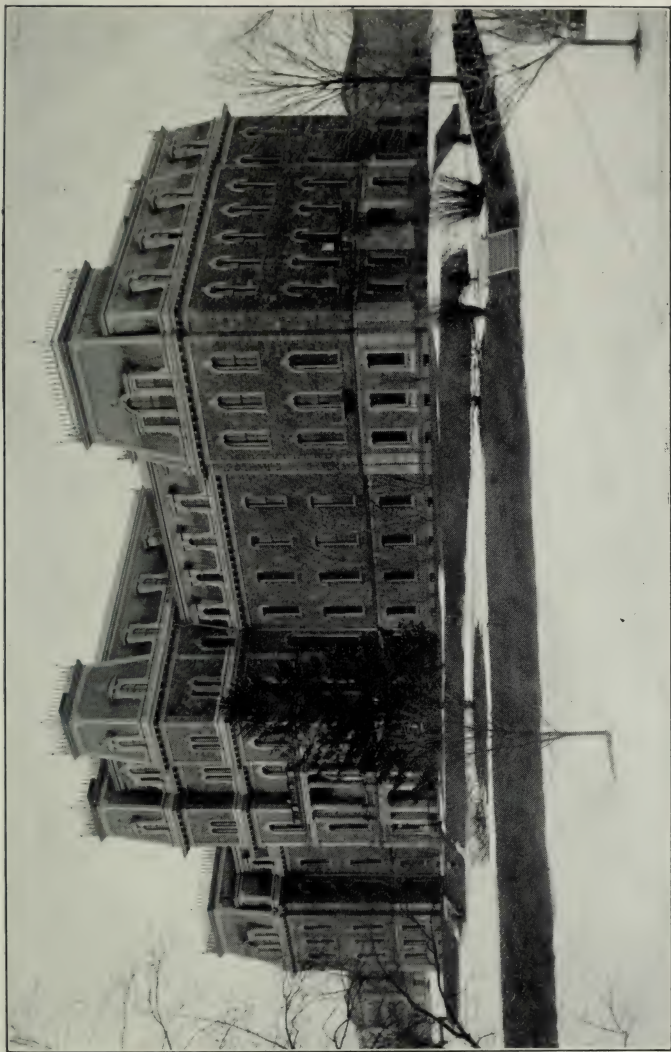
The work in English Literature consists of a course of lectures beginning with the Elizabethan period and

continuing down to the present time. The course extends over the Junior and Senior years and is accompanied by special reading and by weekly and term reports.

Dr. March's Anglo-Saxon Grammar and Reader is used as the basis for a course in Anglo-Saxon given in connection with the study of the English language.

For training in speaking and writing English correctly every student is required to hand in two themes in every term of his College course after Freshman year. Many of them are read in class and criticized as time allows. In this work professors of all departments take part. It is desired that students in each department shall write on subjects connected with it in the words and phrases current among experts, and know the precise meaning of these words and phrases. In these matters the professors in each department are authorities.

- 1-2-3. COMPOSITION AND RHETORIC.—Themes. Conferences every two weeks. Outside reading. First, second and third terms, Freshman year. Two periods per week.
4. ENGLISH LITERATURE AND COMPOSITION.—Preparation 1-2-3. The study of the leading English authors from the Elizabethan period to the present time. Lectures and recitations, outside reading and reports. First, second and third terms, Sophomore year. Two periods per week.
11. ANGLO-SAXON.—March's Anglo-Saxon Grammar and Reader. Second term, Sophomore year. Two periods per week.
- 12-13-14. ADVANCED ANGLO-SAXON.—Preparation: 11. March's Anglo-Saxon Grammar and Reader and additional reading as assigned. Gilbert Prize in Old English (see page 157). First, second and third terms, Junior or Senior year. One period per week.
15. ENGLISH LANGUAGE.—Trench on the Study of Words. Trench Prize (see page 155). First term, Sophomore year. Two periods per week.



PARDEE HALL.

16. ENGLISH LANGUAGE.—Bunyan's *Pilgrim's Progress*, English Syntax, Rhetorical Forms, Grammatical Equivalents, Essays on Bunyan's Life, Times and Works. First term, Sophomore year. Two periods per week.
17. ENGLISH LANGUAGE.—Spenser's *Faery Queen*, Etymology, Romance of Chivalry, Spenserian Stanza, Essays on Spenser's Life, Times and Works. Second term, Sophomore year. Two periods per week.
18. ENGLISH LANGUAGE.—Chaucer's *Canterbury Tales*, Phonetics Orthographic Forms, Essays on Chaucer's Life, Times and Works. Lounsbury Prize (see page 154). Third term, Sophomore year. Four periods per year.
19. ENGLISH LANGUAGE.—Shakespeare. Lectures, Weekly Essays on Shakespeare's Life, Times and Works. Two periods per week. Francis Bacon: Study of the Essays. Lectures, Weekly Essays on Bacon's Life, Times and Works. Two periods per week.
20. ENGLISH LANGUAGE.—Shakespeare: Study of *Hamlet* and other Shakespearean Tragedies. Two periods per week. John Milton: Study of His Dramatic Works. Weekly Essays on Milton's Life, Times and Works. Two periods per week. Second term, Junior year.
21. ENGLISH LANGUAGE.—Study of *Twelfth Night* and other Shakespearean Comedies. Lectures, Weekly reports, Dramatic Criticism. Shakespeare Prize (see page 158). Two periods per week. Holmes: Study of the Autocrat of the Breakfast Table. Essays and reports on Holmes' Times and Works. Two periods per week. Third term, Junior year.
22. ENGLISH LANGUAGE.—English Fiction. Lectures, Assigned Reading, Book Criticism, Weekly Essays. Two periods per week. Thackeray: Study of *Vanity Fair*. Essays on Thackeray's Times and Works. Two periods per week. The Francis A. March Prize (see page 154). First term, Senior year.
23. ENGLISH LANGUAGE.—The English Drama. Lectures and required reading. Two periods per week. English Fiction (continued). Two periods per week. Second term, Senior year.

24. ENGLISH LANGUAGE.—The English Drama. Study of Assigned Texts. Lectures. Weekly Reports. Two periods per week. Ben Jonson: Study of Every Man in his Humour. Essays and reports. Two periods per week. Third term, Senior year.
- 30-31. COMPARATIVE PHILOLOGY.—Whitney's Language and the Study of Language. Third term, Senior year. Three periods per week.
- 41-42. SIXTEENTH AND SEVENTEENTH CENTURY LITERATURE.—Lectures, weekly reports, assigned reading. First and second terms, Junior and Senior years. Four periods per week.
43. EIGHTEENTH CENTURY LITERATURE.—Lectures, weekly reports, assigned reading. Third term, Junior and Senior years. Four periods per week.
44. THE ROMANTIC POETS, 1790-1832.—Lectures, weekly reports, assigned reading. First term, Junior and Senior years. Four periods per week.
- 45-46. LATER NINETEENTH CENTURY LITERATURE.—Lectures, weekly reports, assigned reading. Second and third terms, Junior and Senior years. Four periods per week.
- 41-42-43. Given in 1910-11.
- 44-45-46. Given in 1911-12.

ELOCUTION.

Prof. March, Jr.

- 51-52. ELOCUTION.—Delivering of selected pieces. Required in the Classical and Latin Scientific courses. Optional in all others. Second and third terms, Freshman year.
- 53-54-55. ELOCUTION.—Delivering of selected pieces. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First, second and third terms, Sophomore year.
- 56-57-58. ELOCUTION.—Delivering of original addresses on chosen subjects. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First, second and third terms, Junior year.

59-60. ELOCUTION.—Delivering of unwritten addresses on assigned subjects. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First and second terms, Senior year.

61. ELOCUTION.—Graduating Orations. Required in the Classical Latin Scientific and General Scientific Courses. By special appointment in all others. Third term, Senior year.

GERMAN AND ROMANCE LANGUAGES.

Professors Raschen and Hopkins and Messrs. Pfatteicher and Larned.

GERMAN.

Der Deutsche Verein is an organization of students and officers interested in the study of German language and literature, and of German life and culture. Meetings are held fortnightly on Friday. Advanced students and others who desire to keep up their knowledge of German are invited. The programs consist chiefly of conversations, addresses and the singing of German songs.

Courses 71, 72 are prescribed for technical students who have entered on French. 75 is prescribed for technical students who have entered on German.

71. ELEMENTS OF GERMAN.—Elements of Grammar and Syntax. Prose Composition followed by reading of easy narrative German prose. Second term, Freshman year. Four periods per week.

72. INTERMEDIATE GERMAN.—Preparation: 71. Reading of narrative prose of difficult character. Composition. Third term, Freshman year. Four periods per week.

75. ADVANCED GERMAN.—Preparation: Entrance German B.—The first two weeks will be devoted to a rapid, thorough review of the principles of syntax. This is followed by composition and reading from modern writers as Riehl, Wildenbruch,

- Fulda, etc., and the translation of easy scientific German. The second term will be devoted to reading of scientific German of an advanced character. First term, Freshman year. Four periods per week.
80. ELEMENTS OF GERMAN.—Prescribed for Sophomores in the Classical Course. This Course, in conjunction with Course 81, aims to give a thorough and accurate training in the rudiments of Grammar; to familiarize the student with spoken German as well as written; for this reason the inductive method will be employed, using German almost entirely from the beginning. In this manner the student is quickly made to acquire both "Sprachgefühl" and "Sprachmaterial" so as to read German with ease. Composition and translation of easy graduated texts form part of the exercises each hour. Third term, Sophomore year. Three periods per week.
81. ELEMENTS OF GERMAN.—(Continued).—Prescribed for Juniors in the Classical Course. First term, Junior year. Three periods per week.
- 82-83. INTERMEDIATE GERMAN.—Preparation: 81. Reading of novels and dramas by modern writers such as Heyse, Keller, Fulda, Mörike, Sudermann. Second and third terms, Junior year. Two periods per week.
- 84-85-86. ADVANCED GERMAN.—Preparation: Entrance German A. Prescribed for Freshmen in the Latin Scientific Course. The study of accidence, syntax and etymology will form part of this course. In connection with this, there will be oral practice in German and Composition as well as reading of advanced texts. These texts will be selected so as to vary the reading and to acquaint the student with a variety of style of German writers. In addition to this an easy text will be assigned for outside reading during the second and third terms. First, second and third terms, Freshman year. Four periods per week.
- 87-88. NINETEENTH CENTURY WRITERS.—Preparation: 86. Prescribed for Sophomores in the Latin Scientific Course who have entered on German. This course consists of the study of Prose-fiction of the 19th century. The classes will be conducted in German as far as practicable. Written 'ex-

ercises in German will constitute part of the work. First and second terms, Sophomore year. Two periods per week.

89. HISTORICAL PROSE.—Preparation: 88. Prescribed for Sophomores who have entered on German. Selected readings from German historical writers, and from addresses in the Reichstag. Third term, Sophomore year. Two periods per week.

90-91-92. SCHILLER AND GOETHE.—Preparation: 89. The lives and several of the principal works of these authors will be studied. Lectures on the various aspects of these works are given to supplement the studies and readings in biography and criticism assigned. Elective. First, second and third terms, Junior year. Two periods per week.

93-94-95. GOETHE'S FAUST.—Preparation: 92. Alternates with 96-98. The reading and interpretation of Faust, the First Part in its entirety, the Second Part in selected portions. The study will comprise its genesis, significance, ethics, and artistic character. It is open to those who completed the course on Goethe. Elective. First, second and third terms, Senior year. Two periods per week.

96-97-98. HISTORY OF THE GERMAN DRAMA OF THE 19TH CENTURY.—Preparation: 87-89. The reading and criticism of the various types of modern drama together with a study of their sources and influence. (Alternates with 93-95; not given in 1912.) Elective. First, second and third terms, Senior year. Two periods per week.

99-100-101. HISTORY OF GERMAN LITERATURE; from the earliest beginnings to the end of the Eighteenth Century.—Preparation: 87-89 or 90-92. Lectures and collateral reading and study of the literary movements in Germany. First, second and third terms, Senior year. Two periods per week.

FRENCH.

Courses III, II2 are prescribed for technical students who have entered on German.

III. ELEMENTS OF FRENCH.—Elements of Grammar and Syntax. Prose Composition in connection with reading of easy narrative French prose. Second term, Freshman year. Four periods per week.

112. INTERMEDIATE FRENCH.—Preparation: 111. Reading from modern standard authors. Composition. Third term Freshman year. Four periods per week.

Course 115 is prescribed for technical students who have entered on French.

115. ADVANCED FRENCH.—Preparation Entrance French B. The course will comprise French prose composition and reading of standard French authors. First term, Freshman year. Four periods per week.
126. ELEMENTARY FRENCH.—Prescribed for Sophomores in the Classical and Latin Scientific courses. Fraser and Squair's Grammar; composition; sight reading and translation of easy prose; careful drill in pronunciation. First term, Sophomore year. Two periods per week.
127. FRENCH.—Continuation of foregoing; thorough study of irregular verbs; grammar; composition; translation; and sight-reading of more difficult prose selections from Lazare's Premières Lectures or selected stories from Dumas fils, Halévy, Lavedan, etc. Second term, Sophomore year. Two periods per week.
128. FRENCH.—Grammar and composition continued; translation and sight-reading from Guerlac's Standard French Authors; discussion of the various works of the authors represented. Third term, Sophomore year. Two periods per week.
129. FRENCH.—Readings in French history from Lavis's Histoire de France; discussions. First term, Junior year. Two periods per week.
130. FRENCH.—The Novel. Selections from Dumas' Les Trois Mousquetaires or Hugo's Notre Dame. Second term, Junior year. Two periods per week.
131. FRENCH.—The School of the Realists. Readings from Zola's Débacle. Collateral reading in History of French Literature. Third term, Junior year. Two periods per week.
132. FRENCH.—The Classical Drama—Tragedy. Study of the works of Corneille, Racine and Rotrou. Lectures. First term, senior year. Two periods per week.

133. FRENCH.—The Classical Drama—Comedy. Works of Molière. Second term, Senior year. Two periods per week.
134. FRENCH.—Rise of the Romantic School. Hugo's Ruy Blas or Hernani. Third term, Senior year. Two periods per week.
135. FRENCH.—The Literature of the XVIth Century. Selections from Ronsard, Marguerite de Valois, Marot, Jodelle, etc. The Pléiade. Alternates with 133. Second term, Senior year. Two periods per week.
136. FRENCH.—Historical Grammar. Development of French from Latin. Alternates with 133-134. Third term, Senior year. Two periods per week.

SPANISH.

141. SPANISH.—This course is designed to give the elements of Spanish grammar and to enable the student to translate easy prose from English into Spanish and *vice versa*. Optional for all students. Second term, Junior year. Two periods per week.
142. SPANISH.—Continuation of 141. Third term, Junior year. Two periods per week.

ITALIAN.

151. ITALIAN.—Elements of Italian grammar. Translation of prose from Italian into English and *vice versa*. Optional for all students. Second term, Junior year. Two periods per week.
152. ITALIAN.—Continuation of 151. Third term, Junior year. Two periods per week.

THE GREEK LANGUAGE AND LITERATURE.

Professors Youngman (Prof. Emeritus), and Eckels.

The aim of the Greek Course is to be thoroughly grounded in Greek forms, idioms, and syntax—to learn the composition of words, the formation of phrases and the construction of sentences. In the earlier part of the course there is a daily lesson in the grammar, with a

test of the student's ability to apply it to the text just read. Etymologies and English derivatives are constantly called for.

The best passages of representative authors are translated into the best attainable English. In poetry there is a study of Homer, Sophocles, and Aristophanes; in prose, of Herodotus, for history; of Aeschines and Demosthenes, for oratory. For ethical questions there is a study of Socrates in the *Memorabilia* and the *Apology*.

Attention is directed to Greek life, education, faith, religion, and habits of thought and expression, as compared with our own. The old Greek citizen and the modern American citizen are brought face to face.

Essays are also called for, giving the results of the student's researches. When *De Corona* is read there is a special class debate on the relations of Aeschines and Demosthenes with Philip. When Homer is read there are references to the Bible for comparison of faith, religion, and forms of expression. There is an attempt to bring the students to an intelligent appreciation of the beauty and grace and force in Greek literature, to cultivate the taste, regulate the heart, and discipline the mind.

- 161. **LYSIAS**.—Against Eratosthenes and several shorter orations. Prose Composition. Old Greek Life. First term, Freshman year. Four periods per week.
- 162. **HERODOTUS**.—Books VI and VII. Prose Composition. Second term, Freshman year. Four periods per week.
- 163. **HOMER**.—The *Iliad*—Selections from Books XVIII to XXIV. Greek Literature. Third term, Freshman year. Four periods.
- 164. **HOMER**.—The *Odyssey*—Selections from Books I to XII. First term, Sophomore year. Four periods per week.

165. THE EARLIER ATTIC ORATORS.—Jebb's Selections. History of Greece—Oman. Second term, Sophomore year. Four periods per week.
166. PLATO.—The Apology and Crito—Selections from Xenophon's Memorabilia. Introduction to Greek Philosophy. Third term, Sophomore year. Four periods per week.
167. DEMOSTHENES ON THE CROWN.—History—Period of Demosthenes; Philip and Alexander. Elective. First term, Junior year. Two periods per week.
168. GREEK TRAGEDY.—Sophocles. History of Ancient Drama. Elective. Second term, Junior year. Two periods per week.
169. GREEK TRAGEDY.—Aeschylus or Euripides. Elective. Third term, Junior year. Two periods per week.
170. GREEK COMEDY.—Aristophanes. Elective. First term, Senior year. Two periods per week.
171. THUCYDIDES.—Elective. Second term, Senior year. Two periods per week.
172. PLATO.—Protagoras or Republic. Elective. Third term, Senior year. Two periods per week.

Additional electives, which may also, under some circumstances, be substituted for some of those named above, will be offered from time to time. These will include Lyric and Elegiac Poetry, Theocritus, Lucian, Aristotle's Poetics, New Testament Greek. Junior and Senior electives respectively will usually be open to members of either class, so far as the limitations of the student's schedule permit.

THE LATIN LANGUAGE AND LITERATURE.

Professors Owen, Eckels, and Mr. Lacey.

It is the aim of this Department to give the students an intelligent acquaintance with the language, literature, and institutions of Rome, and qualify them for

the efficient treatment of these subjects as teachers, or for the further scholarly pursuit of these and kindred studies after graduation if they should be so disposed. An effort is made to unite accuracy in details with facility in reading within the limits of a reasonable range.

It is kept in mind, also, that the training in this Department should be practically helpful and valuable to those who are to speak and write the English language. With a view to cultivate the power of expression, besides the oral work of the class-room, there are frequent exercises in writing, in which it is sought to faithfully render the author into the English of our literary standards.

181. LIVY.—Books XXI–XXII, with Roman History and Latin Prose. First term, Freshman year. Four periods per week.
182. HORACE.—Odes and Epodes. Latin Prose. Second term, Freshman year. Four periods per week.
183. HORACE.—Satires and Letters with Roman Antiquities. Third term, Freshman year. Four periods per week.
184. CICERO.—De Oratore with history of the last Century of the Roman Republic. First term, Sophomore year. Four periods per week.
185. LATIN HYMNS.—Latin Hymns with Early Roman Literature. Second term, Sophomore year. Four periods per week.
186. CICERO.—De Officiis. Third term, Sophomore year. Two periods per week.
187. TACITUS.—Agricola and Germania. Roman Literature of the Silver Age. First term, Junior year. Two periods per week.
188. JUVENAL.—Roman Archaeology, illustrated by an Extensive Collection of Roman photographs. Second term, Junior year. Two periods per week.
189. TACITUS.—Annals. Third term, Junior year. Two periods per week.

190. LUCRETIVS.—First term, Senior year. Two periods per week.
191. EPISTOLARY LATIN.—Pliny and Cicero. Second term, Senior year. Two periods per week.
192. CICERO'S TUSCULAN DISPUTATIONS.—Third term, Senior year. Two periods per week.

THE HEBREW LANGUAGE.

Rev. Robert Robinson.

201. ELEMENTARY HEBREW.—Etymological principles of Hebrew; inflexions and laws of euphonic changes. Elective. Second term, Senior year. Two periods per week.
202. HEBREW (Continued).—Translation of portions of Old Testament History from Hebrew into English, and from English into Hebrew. Elective. Third term, Senior year. Two periods per week.

THE BIBLE.

The President, Professors Youngman, Hardy, Owen, Raschen, Roberts, Lyle, Hopkins, Eckels and Messrs. Marquard, Lacey, Pfatteicher, Cawley, Ely and Kaufman.

In the Freshman year a general survey of the Bible will be made with the purpose of impressing upon the students the character of its contents, the various books and their relation to the whole, and familiarizing them with its actual language and ideas. So far as may be profitable for this dominant purpose instruction will be given in Bible history and geography, but the great object is to make the student familiar with the very words of the English Bible.

The Sophomore year is devoted to a detailed study of one of the synoptic gospels. Those who study Greek use

the Greek Testament; those taking the Latin Scientific course, a Latin version and the Technical students use French and German versions.

The Acts of the Apostles is studied in the Junior year. Special attention is given to the lives and labors of the Apostles and the founding of the Christian Church.

In the Senior year the first half year is devoted to a course on the early history of Christianity in which Uhlhorn's Conflict of Christianity with Heathenism is the text-book; the second half to the external history of the English Bible, its translators and translation.

221-22-23. THE BIBLE.—General survey of the Old Testament and the Life of Christ. Required of all students throughout the Freshman year. One period per week.

224-25-26. THE NEW TESTAMENT.—The Gospels, in French. Required of Technical students throughout the Sophomore year. One period per week.

227-28-29. THE NEW TESTAMENT.—The Gospels, in Greek. Required of Classical students throughout the Sophomore year. One period per week.

230-31-32. THE NEW TESTAMENT.—The Gospels, in Latin. Required of Latin Scientific students throughout the Sophomore year. One period per week.

233-34-35. THE NEW TESTAMENT.—The Acts of the Apostles, in German. Required of Technical and General Scientific students throughout the Junior year. One period per week.

236-37-38. THE NEW TESTAMENT.—The Acts of the Apostles in the Greek. Required of Classical students throughout the Junior year. One period per week.

239-40-41. THE NEW TESTAMENT.—The Acts of the Apostles, in Latin. Required of Latin Scientific students throughout the Junior year. One period per week.

242-43. CHURCH HISTORY.—Uhlhorn's Conflict of Christianity with Heathenism. Required of all students. First and second terms, Senior year. One period per week.

244. HISTORY OF THE ENGLISH BIBLE.—Required of all students. Third term, Senior year. One period per week.

PHILOSOPHY.

Professor Mecklin.

The required courses in Philosophy are Logic, Psychology, Introduction to Philosophy, Ethics and Theism. They are continuous and cover five consecutive terms beginning with the first term of the Junior year. In addition to these, elective courses are offered in the History of Philosophy, Advanced Psychology, the Psychology of Education and the History of Education.

251. LOGIC.—Two hours a week during the first term and it may be taken either the Junior or the Senior year. The aim of this course is to acquaint the student with the laws of discursive thinking, particular emphasis being laid upon ambiguity, the fallacies and the principles of scientific method (Creighton, *An Introductory Logic*, or Bode, *An Outline of Logic*).
252. PSYCHOLOGY.—Three hours a week during the second term of the Junior year. In this course the student gains a knowledge of the simpler facts of the mental life and their relations to the physiological basis in the sense organs and the nervous system. The lectures are supplemented by parallel reading and simple experiments and exercises (Angell, *Psychology*, or Calkins, *A First Book in Psychology*).
253. ADVANCED PSYCHOLOGY.—Two hours a week during the first term of the Senior year. This is a continuation of course 252 and is intended to supplement the courses in Ethics and Education. It consists of lectures and parallel readings with reports.
254. INTRODUCTION TO PHILOSOPHY. Two hours a week during the third term of the Junior year. This course is designed to introduce the student to the main problems of Epistemology and Metaphysics and to acquaint him with the scope

and relations of special philosophical disciplines (Kuelpe, *Introduction to Philosophy*).

281. ETHICS.—Three hours a week during the first term of the Senior year. The facts of the moral life are presented as a series of problems such as the problem of the origin of moral sentiment, of the content of moral judgment, of the end or standard, etc. The method adopted is genetic and ultimate principles are attained through an analysis of the familiar facts of experience (Muirhead, *The Elements of Ethics*, or Dewey and Tufts, *Ethics*).
291. ANCIENT AND MEDIAEVAL PHILOSOPHY.—Two hours a week during the first term of the Senior year. This course traces the rise and development of the philosophical impulse through the Greek, the Greco-Roman and the mediaeval periods. The attempt is made to correlate the various philosophical tendencies with the civilizations that fostered them (Weber, *History of Philosophy*, Rogers, *Student's History of Philosophy*, Windelband, *A History of Philosophy*).
292. MODERN PHILOSOPHY FROM DESCARTES TO HEGEL.—Two hours during the second term of of the Senior year. In this course, which is a continuation of course 291, the classical philosophical systems from Descartes to the German Idealists are discussed and analyzed. Rand's, *Modern Classical Philosophers* is used as parallel reading.
293. PHILOSOPHY OF THE NINETEENTH CENTURY.—Two hours during the third term of the Senior year. A continuation of courses 291 and 292, in which particular attention is given to the philosophical tendencies of the present time.
301. HISTORY OF EDUCATION.—Two hours a week during the second term Senior. Text-book, Monroe's, *A Brief Course in the History of Education*, with parallel reading and reports.
302. THEISM.—Two hours a week during the first term of the Senior year. This course sets forth the grounds of theistic belief as necessary to a broad and liberal culture and sound Christian scholarship. The anti-theistic theories such as pantheism, materialism, positivism, etc., receive critical attention. (Flint, *Anti-theistic Theories*).

303. PSYCHOLOGY OF EDUCATION. Two hours during the third term of the Senior year. Text-book, Bagley's, *Educative Process* or Horne's, *Psychological Principles of Education*.

HISTORY, POLITICAL AND SOCIAL SCIENCE.

The President and Professors Owen, Roberts and Eckels, and Mr. Kirkpatrick.

The work of this department is designed to give such a general knowledge of History and Political Science as belongs to a liberal education. At the same time sufficient work is offered in the electives to prepare those students who desire to take up graduate work or to engage in the practice of law or the public service or teaching. The instruction is given by text-book, by lectures, and by library references, the students reporting the results of their reading partly during the regular work of the class, and partly in the form of essays. The subjects covered by the course are in detail as follows:

311. ANCIENT HISTORY.—Survey of the history of Greece and Rome in connection with the courses in Latin and Greek. Political, Social, literary and philosophical history of each epoch. Classical Geography.
- 321-22. HISTORY OF ENGLAND.—The narrative history of England is made the basis of study, but especial attention is given to the economic, social and intellectual history of the country, and to the development of English institutions. The general aim of this course, in its method, is to prepare for the courses in American History. Green's *Short History of the English People* is used as a text-book, and the importance of collateral readings is emphasized. First and second terms, Junior year. Two periods per week.
331. AMERICAN HISTORY.—The course in Colonial History is intended to trace the beginnings of the American nation rather than the details of the history of the individual colonies. Emphasis is therefore laid on the European inheritance brought

to this country by the colonists, their development of American institutions in the new environment, the expansion of population, the struggle between France and England for North America, the underlying causes of the Revolution, the growth of independence and union. Thwaite's *The Colonies* and Hart's *Formation of the Union* are used as text-books, supplemented by lectures, reading and reports. Second term, Junior year. Two periods per week.

351. CONSTITUTIONAL HISTORY.—The United States. A required course dealing with the Constitution from the point of view of its historical development. Fiske's *Critical Period of American History* is used as an introduction to this course, and it is accompanied by a critical study of several important constitutional documents, such as *Magna Charta*, the *Petition of Right*, the *Articles of Confederation*, and the *Ordinance of 1787*. Then the Constitution is taken up section by section and studied with reference to its historical development and its subsequent interpretation and construction. Third term, Junior year. Two periods per week.
- 352-53. CONSTITUTIONAL HISTORY.—The United States (Continued). Preparation: 351. Detailed study of the subject, with Bryce's *American Commonwealth* as an introduction and general guide. Lectures, discussions and written reports on questions of American citizenship. Elective. Second and third terms, Senior year. Two periods per week.
- 361-62-63. GENERAL CONSTITUTIONAL HISTORY.—A course in General Constitutional History is begun as a required course in the first term of the Senior year and continued as an elective through the second and third terms. It begins with the origin of the State, and following the plan of Woodrow Wilson's *The State* pursues the development down to the present time. The recitations are supplemented by lectures and reading, with written reports of investigations. Two periods per week.
- 371-72. LAW.—Elective courses in Blackstone's *Commentaries* and *Business Law*. Second and third terms, Senior year. Two periods per week.
376. INTERNATIONAL LAW.—The course in International Law



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undertakes to do little more than to exhibit the fundamental principles which govern international affairs, and by the study of a few important cases to show the method of diplomatic procedure. It is especially intended to give the students the information needed to understand current discussions of foreign relations. Text-book—Lawrence's Principles of International Law. First term, Senior year. Two periods per week.

381-82. POLITICAL ECONOMY.—The course in Political Economy consists of a rapid survey of the principles during second term, Senior year, and of the discussion of practical applications of economic theories during the third term. Special attention, however, is given to the questions which are vital issues of the day, such as Finance and the Tariff. The utmost care is taken to avoid the teaching of party politics under the guise of Economic Science. At the same time the teaching in this Department recognizes the importance of inculcating honest views on the money question and the right of American citizens to know what can be said for the American policy of Protection both in the abstract and in its actual workings. Second and third terms, Senior year. Two periods per week.

391. SOCIOLOGY.—Preparation: Required studies of Junior year and first term, Senior year. This course is designed to prepare the student for intelligent study of the practical problems of modern society. An analysis of the major forces in the organization of modern society, with some account of the proper relation of the social sciences, is attempted. This is followed by an outline study of the great institutions of civilization, their origin and development. The particular study of typical social problems completes the course. Lectures and dictation are supplemented by the use of Wright's practical Sociology, reports and discussions. Elective, second and third terms, Senior year. Two periods per week.

MATHEMATICS.

Professors Hardy and Hall, and Messrs. Marquard, Hatch, Cawley, Ely, Preston and Lehman.

It is strongly recommended that algebra be thoroughly reviewed just before admission to college.

401. ALGEBRA.—Binomial theorem, theory of logarithms, prob-

- ability, variables and limits, series and theory of equations. Text-book—College Algebra. First term, Freshman year. Four periods per week.
402. ALGEBRA.—Preparation: Entrance Mathematics B. Through Ratio, Proportion and Variation. First term, Freshman year. Two periods per week.
403. ALGEBRA COMPLETED.—Preparation: 402. (Continuation of 402). Second term, Freshman year. Four periods per week.
404. ALGEBRA.—To Progressions. Second term, Freshman year. Four periods per week.
405. ALGEBRA COMPLETED.—(Continuation of 404.) Third term, Freshman year. Four periods per week.
406. GEOMETRY.—Solid Geometry. First term, Freshman year. Two periods per week.
407. GEOMETRY.—Solid Geometry. First term, Freshman year. Four periods per week.
411. TRIGONOMETRY.—The work in this course begins with a rapid review of the elementary Plane Trigonometry. Then follows the advanced Plane Trigonometry, consisting of derivation of formulas and trigonometrical series, solution of right- and oblique-angled triangles and solution of problems involving the practical applications. About one-third of the term is devoted to Solid Trigonometry which is also completed. Text-book—Crawley's Trigonometry. Second term, Freshman year. Five periods per week.
412. TRIGONOMETRY.—Preparation: 403, 406. Third term, Freshman year. Four periods per week.
413. TRIGONOMETRY.—Preparation: 405–406. First term, Sophomore year. Four periods per week.
416. ANALYTICAL GEOMETRY.—The work in this subject consists of the Analytical Geometry of two dimensions, including the point, right line and circle; the conics, tangents, diameters, transformation of coördinates, the general equation of the second degree and higher plane curves; also the Analytical Geometry of three dimensions, including the point, the plane and surfaces of revolution. Text-book—Ashton's Analytic

Geometry. Third term, Freshman year. Three periods per week.

417. ANALYTICAL GEOMETRY (Continued).—First term, Sophomore year. Two periods per week.

418. ANALYTICAL GEOMETRY.—Preparation: 412. Drawing of curves from their equations; accurate demonstrations of propositions. First term, Sophomore year. Four periods per week.

419. ANALYTICAL GEOMETRY.—Preparation: 418. (Continuation of 418.) Four periods per week. Second term, Sophomore year. Four periods per week.

420. ANALYTICAL GEOMETRY.—Preparation: 413. Same as 418. Second term, Sophomore year. Four periods per week.

421. MENSURATION AND LOGARITHMS.—The work includes the mensuration of the ordinary geometrical magnitudes, conic sections and curved surfaces and solids. The prismoidal formula, Simpson's rule, etc., are given. Much practice is given in logarithmic computations in problems relating to Physics, Mechanics and Engineering. Text-book—Hall's Mensuration. Third term, Freshman year. Two periods per week.

426. DIFFERENTIAL AND INTEGRAL CALCULUS.—The work in the Differential Calculus consists of the differentiation of all the functions of one or more variables, successive differentiation, implicit functions, development of function, evaluation of indeterminate forms, maxima and minima, properties of curves and radius of curvature, together with numerous practical applications in Mechanics. In the Integral Calculus are treated the integration of rational, irrational and transcendental functions, integration by parts and successive integration, rectification of curves, quadrature of plane surfaces, surfaces and volumes of solids, centers of gravity of lines, surfaces and solids, and moments of inertia. Text-book—Hall's Differential and Integral Calculus. First term, Sophomore year. Three periods per week.

427. DIFFERENTIAL AND INTEGRAL CALCULUS (Continued).—Second term, Sophomore year. Five periods per week.

429. DIFFERENTIAL CALCULUS.—Preparation: 419-420. Elective. First term, Junior year. Four periods per week.
430. INTEGRAL CALCULUS.—Preparation: 429. Elective. Second term, Junior year. Four periods per week.
431. CALCULUS.—Preparation: 430. Application of the Calculus to the study of Loci. Elective. Third term, Junior year. Four periods per week.
432. DIFFERENTIAL EQUATIONS.—Preparation: 431. Elective. First term, Senior year. Two periods per week.
- 433-44. THEORY OF FUNCTIONS.—Preparation: 432. Elective. Second and third terms, Senior year. Two periods per week.
436. LEAST SQUARES.—Law of probability of error, adjustment of observations, precision of observations and empirical formulas. The problems are selected with particular attention to the needs of engineers. Text-book—Merriman's Least Squares. First term, Junior year. Two periods per week, for half term.
437. DIFFERENTIAL EQUATIONS.—In this subject are given the principal differential equations of the first order and degree and those of the second order that are of importance in the applied mathematics that follow. Text-book—Hall's Differential and Integral Calculus. First term, Junior year. Two periods per week.

DRAWING AND DESCRIPTIVE GEOMETRY.

Professor Graves and Messrs. Hatch and Preston.

- 441a. DRAWING.—Use of drawing instruments and materials; elementary plates of such a nature as to give the student ability in performing the simpler operations of drawing. Text-book, Reid's, *Mechanical Drawing*. First term, Freshman year, two 2 hour exercises per week.
- 441b. DRAWING.—Pen and brush shading; engineering conventions; structures in wood, railroad trestles, etc. Second term, Freshman year. Two 2 hour exercises per week.
- 441c. DRAWING AND PROJECTIONS.—Plates in structural steel,

as built up columns, girder connections, etc., and tracings of same. Orthographic projections of points and lines; projections of various solids, and the obtaining of sectional views. Text-book, Reid's, *Mechanical Drawing and Lectures*. Third term, Freshman year. Two periods per week.

442a. LETTERING.—Analytical study of, and practice in making letters suitable for general use in drafting. Text-book, Reinhardt's, *Free-hand Lettering*. First term Freshman year, Two 1 hour exercises per week.

442b. LETTERING.—The lettering of connected sentences to acquire facility in spacing, etc.; lettering suitable for titles. Reinhardt's, *Freed-hand Lettering*. Second term, Freshman year. Two 1 hour exercises per week.

451a. DESCRIPTIVE GEOMETRY.—Problems on the point, line, and plane, with practical applications. Text-book, Hall's, *Descriptive Geometry*. First term, Sophomore year. Two recitations and 1 hour of drawing per week.

451b. DESCRIPTIVE GEOMETRY.—Surface of single and double curvature; intersections and developments; planes tangent to solids; practical applications. Text-book, Hall's, *Descriptive Geometry*. Second term, Sophomore year. Two recitations and 1 hour of drawing per week.

451c. DESCRIPTIVE GEOMETRY.—The applications of the principles of Descriptive Geometry to isometric drawing; shades and shadows; the shadows of isometric drawings; perspective drawing and shadows. Lectures, recitations, and drawings. Third term, Sophomore year. Two recitations and 1 hour of drawing per week.

452. MACHINE DRAWING.—Neat, free-hand sketches of actual pieces of machinery such as pulleys, gears, shaft hangers, pistons, valves, eccentrics, etc. From these sketches, drawings and tracings are made; the elements of machine design. The object of this course is to enable the student to satisfactorily perform the duties of a mechanical draftsman. Third term, Sophomore year. Two 2 hour exercises per week.

PHYSICS.

Professor Gordon, Messrs. Koerber and Faulconer.

Courses 461-463 constitute the work in Physics required of all students. Technical students take these courses during their Sophomore year and others the third term of Sophomore and the first two terms of Junior year.

461. MECHANICS AND HEAT.—Experimental lectures, recitations and laboratory work. First term, Sophomore or Junior year. Four periods per year.
462. ELECTRICITY AND MAGNETISM.—Experimental lectures, recitations and laboratory work. Second term, Sophomore or Junior years. Four periods per week.
463. SOUND AND LIGHT.—Experimental lectures, recitations and laboratory work. Third term, Sophomore or Junior years. Four periods per week.
464. PHYSICAL MEASUREMENTS.—Recitations and laboratory work. Advanced experiments in Mechanics and Heat. First term. Two periods per week. Elective. Required for Electrical Engineering students. Sophomore year.
465. ELECTRICAL MEASUREMENTS.—Recitations and laboratory work. The Wheatstone Bridge, Carey Foster Bridge, Murray and Varley Loops, High and Low Resistance, Temperature Coefficients of Resistance, and other experiments. Second term. Two periods per week. Elective. Required for Electrical Engineering students. Sophomore year.
466. ELECTRICAL MEASUREMENTS.—Recitations and laboratory work. The magnetic properties of iron, capacity, inductance, calibration of voltmeters and ammeters, comparison of electromotive forces. Third term. Two periods per week. Elective. Required for Electrical Engineering students. Sophomore year.
467. ADVANCED ELECTRICITY.—Lectures recitations, and laboratory work. The conduction of electricity through gases and radioactivity. First term, Senior year. Two periods per week. Elective.
468. ADVANCED ELECTRICITY.—Portions of Electrostatics, electric

waves and the relations between electricity and light. Third term, Senior year. Two periods per week. Elective.

469. ELECTROCHEMISTRY.—Lectures, recitations and laboratory work. Conductivity of solutions, velocity of ions, standard cells, concentration cells, polarization, the thermodynamic and osmotic theory of cells. Third term, Junior year. Two periods per week. Elective.
470. OPTICS.—Lectures, recitations and laboratory work. The spectrometer, gratings, Fresnel's mirrors and prism, the interferometer, and the polarimeter. Two periods per week. Second term, Senior year. Elective.
472. APPLIED MECHANICS.—Statics. Principles of equilibrium and their application to flexible cords, tackle, jointed structures; frictions, moment of inertia. Kinematics. Rectilinear motion, curvilinear motion, harmonic motion, motions of a rigid body, translation, rotation, plane motion. Third term, Sophomore year. Four periods per week. Required for technical students.
473. APPLIED MECHANICS.—Kinetics. Motion of a particle. translation of a rigid body, rotation, plane motion of a rigid body, work and energy, impulse and momentum. First term, Junior year. Four periods per week. Required for all technical students.

MINERALOGY AND GEOLOGY.

Professor Peck.

The course in Geology is continuous and each term's work depends upon that which has preceded. It is desirable that students electing this subject should do so for at least two terms and that they should be familiar with the elements of Physics, Chemistry and Biology. For the work of the Senior year, a knowledge of these subjects is required.

491. DYNAMICAL, STRUCTURAL AND PHYSIOGRAPHICAL GEOLOGY.—Text-book and illustrated lectures. Elective. First term, Junior year. Two periods per week.

492. HISTORICAL GEOLOGY.—Preparation: 491. Stratigraphic sequence of rocks, and fossil forms. Elective. Second term, Junior year. Two periods per week.
493. CRYSTALLOGRAPHY.—Preparation: 492. Crystal forms, properties of crystalline substances, drawing and measurements of crystals. Elective. Third term, Junior year. Two periods per week.
494. PRACTICAL FIELD GEOLOGY.—Preparation: 493. Elective. First term, Senior year. Two periods per week.
495. ADVANCED CRYSTALLOGRAPHY AND ELEMENTARY PETROGRAPHY.—Preparation: 494. Elective. Second term, Senior year. Two periods per week.
496. FIELD GEOLOGY.—Preparation: 495. Elective. Third term, Senior year. Two periods per week.
511. CRYSTALLOGRAPHY.—This course is illustrated with glass and wooden models, and each alternate exercise consists of a practicum at which well-crystallized minerals are studied, and their properties discussed. The latter part of the term is devoted to a brief discussion of the optics of crystals. Text-book—Williams' Elements of Crystallography. First term, Junior year. Two periods per week.
512. PETROGRAPHY.—A large collection of hand specimens of rocks with thin sections are used in this study. Text-book—Kemp's Handbook of Rocks. Second term, Junior year. Two periods per week.
513. MINERALOGY.—A systematic review of mineral species, more special attention being paid to their chemical and crystallographic relations and to their mode of occurrence in nature. Instruction is given by lectures which are illustrated by a study collection consisting of some two thousand specimens, including the most important species. A course in determinative mineralogy supplements these lectures. The student is required to determine sixty minerals and to write out a description of each. Third term, Junior year. Three periods per week.
516. GENERAL GEOLOGY.—Dynamical, Structural and Physio-graphical Geology. The work of the class-room is supple-

mented by excursions into the neighboring region, and sufficient time is devoted to field work to enable each student to construct a six-inch section up and down the Delaware River at Easton. Text-book—Scott's Introduction of Geology. First term, Senior year. Two periods per week.

517. GENERAL GEOLOGY.—Continuation of Course 516. Historical Geology. Accumulations, organic and inorganic, which are of economic importance. Text-book—Scott's Introduction to Geology. Second term, Senior year. Two periods per week.
521. MINING GEOLOGY. ECONOMIC GEOLOGY.—Practical geology of the metalliferous deposits. This is a lecture course, but reading is assigned in the following works: "Economic Geology of the United States," Ries; "Ore Deposits of the United States and Canada," Kemp; "The Nature of Ore Deposits," Beck; etc. Second term, Senior year. Two periods per week.
522. MINING GEOLOGY.—FIELD GEOLOGY.—In this course the student makes a detailed study of an area, from which he constructs a colored geological map and geological sections. Specimens of the different ores are collected and then sections are cut for microscopical examination. Third term, Senior year. Two periods per week.
523. MINING GEOLOGY.—Elective. First term, Senior year. Two periods per week.
524. MINING GEOLOGY.—Elective. Second term, Senior year. Two periods per week.

ASTRONOMY.

Professor Hardy and Mr. Smith.

531. DESCRIPTIVE ASTRONOMY.—Fundamental definitions of the celestial sphere, parallax, refraction, the earth as an astronomical body, the sun, the moon eclipses and the planets. Text-book—Young's Astronomy. First term, Senior year. Two periods per week.
536. DESCRIPTIVE ASTRONOMY.—More detailed course than 531. First term, Senior year. Four periods per week.

541-42. PRACTICAL ASTRONOMY.—The use of the sextant in determining time by a single altitude of the sun, by a single altitude of a star, by equal altitudes of the sun, by equal altitudes of a star; in determining latitude by the meridian altitude of a star in any position, by circummeridian altitudes; and in determining longitude by lunar distances. The instrumental constants of the transit instrument and its use in determining longitude. The use of the zenith telescope in determining latitude. The sections of the class are made so small that each student gets considerable practice with the instruments. Second and third terms, Senior year. Two periods per week.

BIOLOGY.

Professor Davison and Mr. Foster.

The work of this Department occupies all of the ten rooms in Jenks Biological Hall. A general laboratory, forty by sixty feet, and four special laboratories well equipped with modern apparatus, in addition to an herbarium and vivarium provide ample facilities for pursuing practical studies on plant and animal life.

The courses in Biology, excepting Sanitary Biology required for the Civil Engineers and Chemists, are elective only, and consist of work throughout the Junior and Senior years. They are open for election to Classical, Latin Scientific, and General Scientific students. In order to meet the double purpose of a professional preparation and general culture, the courses are so arranged as to provide in each the special knowledge required without sacrificing the ends of general culture and discipline, which is sought in all the undergraduate courses. Those not wishing to take the complete course, and yet desiring to know the meaning of the life forms, the relation of plants and animals to one another and especially to man, and to understand the factors and methods

of evolution, should pursue the work of the last two terms of the Junior year and the first term of the Senior year. One may, however, begin his biological studies at any time prior to the second term of the Senior year. The work of the second and third terms of the Senior years is designed for those expecting to enter the professions of teaching or medicine.

551. **MAMMALIAN ANATOMY.**—This enables the student to secure a definite idea of the structure of his own body, to understand some of the evidences of evolution of animals and realize the unity of structure of the animal kingdom. A discussion of parts of the cat or dog together with studies and demonstrations on certain dissected mammals with special reference to the nervous system makes an excellent preparation for the study of Psychology and Physiology. Elective. First term Junior year. Two periods per week.

552. **VERTEBRATE ZOOLOGY.**—The laboratory work involves a study of one or more types representing each of the five classes of vertebrates. The evolution of the various organs and systems and the origin and development of certain forms of animals together with their habits and natural history furnish fertile topics for recitations and lectures. This course, in connection with General Biology, course 553, gives the student a general survey of the entire animal kingdom. Elective. Second term, Junior year. Four periods per week.

553. **GENERAL BIOLOGY.**—The morphology and life history of a few types of the invertebrates are studied with a view to understanding the processes of life and the relation of one form of life to another. Darwinism and the allied problems struggle for existence, parasitism, etc., are discussed, and considerable attention is given to the interdependence of animals and plants, and insects and birds. A well-equipped laboratory with microscopes, aquaria and terraria, offering access to numerous specimens living and preserved, furnishes every advantage to those pursuing this course. Elective. Third term, Junior year. Four periods per week.

554. BACTERIOLOGY AND HEALTH.—Preparation: 551, 553 or 571. This work occupies four periods per week during the first term of the Senior year. A considerable amount of laboratory work, supplemented by investigations in a well-equipped library, and by lectures and demonstrations, is applied to a study of the form, habits and use of bacteria, their relation to agriculture, to industrial processes and to disease. Incubators, water-baths, sand and domestic filters, and microscopes equipped with oil immersion lenses enable the students to make a practical study of the cause and prevention of disease, including disinfection, disposal of sewage, sanitary analysis of water and milk. The necessity and method of ventilation and natural and artificial immunity are treated in the light of the twentieth century knowledge. Elective. First term, Senior year. Four periods per week.
555. PHYSIOLOGY.—Preparation: 551, 553 or 554. The laboratory work consists of the performance of certain experiments and a microscopic study of the chief organs in man. The recitations and lectures are devoted chiefly to the physiological problems relating to the digestive, vascular, respiratory, excretory and nervous systems. Elective. Second term, Senior year. Four periods per week.
556. EMBRYOLOGY AND HISTOLOGY.—Preparation: 551 or 552 and 555. The maturation and fertilization of the egg of *Ascaris*, the segmentation of the egg and the formation of the germinal layers in fish and amphibians, and the origin and early development of the chief organs in chick embryos, and the derivation and function of the fetal membranes in birds and mammals constitute the laboratory work. Discussion of these subjects, together with certain questions in cytology, such as the nature of the germ plasm, germinal selection, and heredity, occupy the hours of recitation. A brief study of the chief tissues of some mammal is also made. Each student is required to fix, harden, embed, section, stain and mount material for microscopic work. Twenty compound microscopes, each equipped with three objectives, triple nose piece, and full substage apparatus, in addition to automatic and sliding microtomes, water-baths, incubators, etc., offer excellent

opportunities to those preparing for medicine or special biological work. Either Course II or III, and Course VI are required as a preparation for this course. Elective. Third term, Senior year. Four periods per week.

561. **SANITARY BIOLOGY.**—The cause and prevention of disease, the rôle of bacteria in the septic tank; the effect of polluted water on health; biological analysis of water. The Biological Laboratory is used by students in this course prior to their work in Water Supply and Sewerage. It contains equipment fitted for the study of Sanitary Biology, *viz.*, twenty compound microscopes, a dozen aquaria, several sets of Sedgwick-Rafter apparatus, modern sand and house filters, drying ovens, sterilizers, incubators, fermentation tubes, petri dishes, etc., furnishing the necessary facilities for a practical study of the algae, aquatic animals and bacteria relating to sewage disposal and water supply. Required for Civil Engineers and Chemists. Elective for others. Third term, Junior year. Two periods per week.

571. **BOTANY.**—The time is largely devoted to the study of the morphology and life history of the lower plants from bacteria to ferns and an explanation of the physiological processes in plants. The relation of insects to plants and plants to man, together with the problem of breeding new varieties, are some of the practical topics considered. Excellent advantages for pursuing this branch are offered by the well-equipped laboratory and extensive College Herbarium containing representatives of nearly all the mosses, ferns and flowering plants in Pennsylvania in addition to hundreds of species from other regions of North America. Elective. First term, Junior year. Two periods per week.

HYGIENE AND PHYSICAL CULTURE.

Professor Davidson and Mr. Bruce.

580. Lectures on Health and the general principles of Physiology and Anatomy illustrated by diagrams.

PHYSICAL CULTURE.—Gymnasium drills. Freshman and Sophomore years. Four exercises per week.

CIVIL ENGINEERING.

*Professors Porter and Lyle and Messrs. Thoroughgood,
Merrill and Anderson.*

601. SURVEYING.—Chain, compass and transit surveying. Leveling, topographical drafting. Text-book—Breed and Hosmer's Plane Surveying. Third term, Freshman year. Two periods per week.
602. SUMMER SCHOOL.—Field problems in use of chain, level and transit. Survey of College Campus. Map. Area computations. Three weeks in vacation at end of Freshman year.
603. SURVEYING.—Trigonometric and barometric leveling. Use of plane-table sextant and solar transit. Hydrographic surveying. Topographic drafting. Text-book—Breed and Hosmer's Higher Surveying. First term, Sophomore year. Two periods per week.
604. SURVEYING.—Trigonometric and barometric leveling. Use of plane-table, sextant and solar transit. Topographic drafting. Text-book—Breed and Hosmer's Higher Surveying. First term, Junior year. Two periods per week.
611. RAILROADS.—Simple, reverse, compound, vertical and transition curves. Drafting. Text-book—Allen's Railroad Curves and Earthwork. Second term, Sophomore year. Two periods per week. Given to Mining Engineering students, first term, Junior year.
612. RAILROADS.—Turnouts, cross-overs. Paper location of railroad. Estimate of cost. Drafting. Field problems. Text-book—Allen's Railroad Curves and Earthwork. Third term, Sophomore year. Two periods per week.
613. SUMMER SCHOOL.—Railroad reconnaissance. Preliminary and final location. Cross-sectioning. Map. Three weeks in vacation at end of Sophomore year.
614. RAILROADS.—Computation of earthwork from notes of Summer School Survey. Problems in Earthwork. Mass diagrams. Drafting. Text-book—Allen's Railroad Curves and Earthwork. First term, Junior year. Three periods per week.
615. RAILROADS.—Economic location. Traffic. Operating ex-

penses. Cars and locomotives. Virtual grades. Text-book—Wellington's Economic Theory of Railroad Location. Second term, Junior year. Two periods per week.

616. RAILROADS.—Transportation. Management. Design. Terminals, signals and railroad structures. Camp's Notes on Track. Third term, Junior year. Two periods per week.

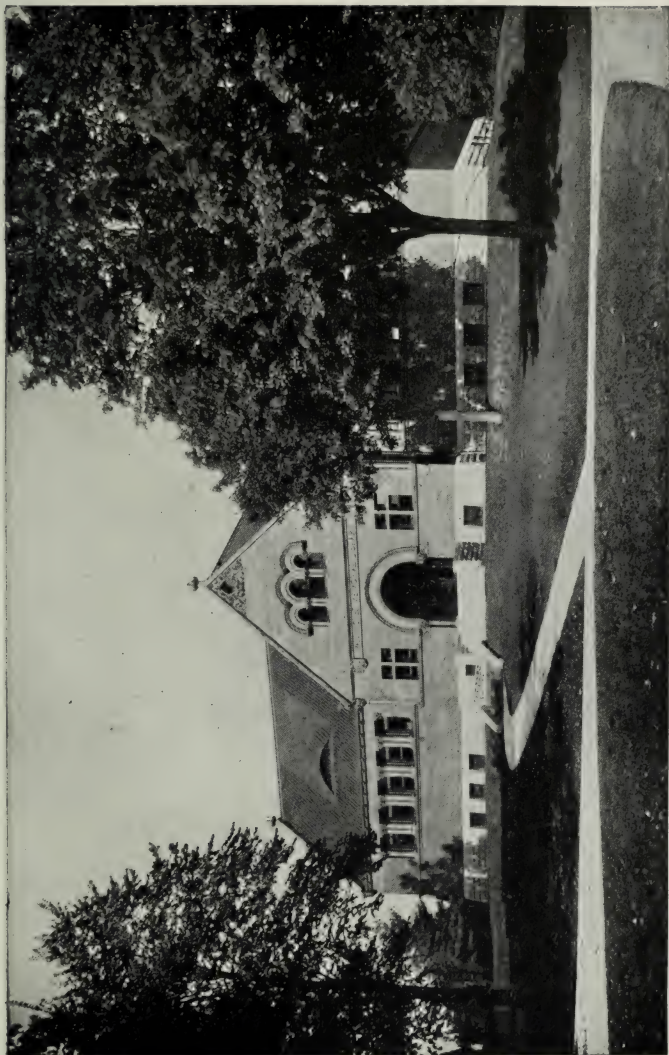
622. APPLIED MECHANICS. STATICS.—Principles of equilibrium and their application to flexible cords, tackle, jointed structures, friction, moment of inertia. Kinematics. Rectilinear motion, curvilinear motion, harmonic motion. Motion of a rigid body, translation, rotation, plane motion. Text-book—Maurer's Mechanics. Third term, Sophomore year. Four periods per week.

623. APPLIED MECHANICS. KINETICS.—Motion of a particle, translation of a rigid body, rotation, plane motion of a rigid body, work and energy, impulse and momentum. First term, Junior year. Four periods per week.

624. MECHANICS OF MATERIALS. RECITATIONS.—The principles of stress and strain; the behavior of materials under tension, compression and shearing; investigation and design of pipes, riveted joints, boilers and standpipes; strength and flexure of simple and cantilever beams. Report on the carrying capacity of a floor. Text-book—Merriman's Mechanics of Materials. LABORATORY. Study and use of testing machines. Commercial tension tests of iron and steel. Modulus of elasticity in tension and compression and shear tests of iron, steel and wood. First term, Junior year. Four periods per week.

625. MECHANICS OF MATERIALS.—RECITATIONS. Restrained and continuous beams; columns; shafts; reinforced concrete. Impact and fatigue; true and internal stresses; mathematical theory of elasticity. Design of an I-beam highway bridge and of a steel standpipe. Text-book—Merriman's Mechanics of Materials. LABORATORY. Transverse tests of cast iron and wood; modulus of elasticity of steel in bending; tests of wooden columns; torsion tests of iron and steel; calibration of testing machines; modulus of elasticity of concrete; reinforced concrete beams. Second term, Junior year. Four periods per week.

627. MECHANICS OF MATERIALS.—RECITATIONS. The principles of stress and strain; the behavior of materials under tension, compression and shearing; investigation and design of pipes, riveted joints, boilers and standpipes; strength and flexure of simple and cantilever beams. Report on the carrying capacity of a floor. Text-book—Merriman's Mechanics of Materials. LABORATORY. Study and use of testing machines. Commercial tension tests of iron and steel. Modulus of elasticity in tension and compression; and shear tests of iron, steel and wood. Second term, Junior year. Three periods per week.
628. MECHANICS OF MATERIALS.—RECITATIONS. Restrained and continuous beams; columns; shafts; reinforced concrete. Text-book—Merriman's Mechanics of Materials. LABORATORY. Transverse tests of cast iron and wood; modulus of elasticity of steel in bending; tests of wooden columns; torsion tests of iron and steel; calibration of testing machines. Third term, Junior year. Three periods per week.
631. ROADS AND PAVEMENTS.—RECITATIONS. Reconnaissance location, construction and maintenance of town and country roads, city streets and pavements, together with the methods of street cleaning. Text-book—Baker's Roads and Pavements. LABORATORY. Standard tests of paving brick and road metal. Second term, Junior year. Two periods per week.
641. MASONRY.—The requisites of stone, brick and cement; the different kinds of bonds; strength of stone, brick and concrete masonry; the construction of foundations, bridge piers, abutments, retaining walls, dams, culverts and arches. Text-book—Baker's Masonry. Third term, Junior year. Two periods per week.
642. MASONRY DESIGN.—Design of a dam, an arch and a culvert, using both graphical and numerical processes. Notes. First term, Senior year. Two periods per week.
651. CEMENT.—RECITATIONS. The study of raw materials; method of manufacture; meaning and interpretation of different physical tests; the sources of error in testing; the inspection and sampling of both Portland and Natural Cements. Visits



VAN WICKLE MEMORIAL LIBRARY.

to cement mills and sampling and testing of a shipment of cement. **LABORATORY.** Tests of Portland and Natural cements are made in accordance with standard methods and specifications, the aim being to have the student become thoroughly acquainted with each standard test and understand and appreciate the significance of the results obtained. Special tests are made to show the effect of varying from standard methods. Text-book—Taylor's Practical Cement Testing. Laboratory Notes. First Term, Junior year. Two periods per week.

652. **CONCRETE.—RECITATIONS.** Materials for concrete; proportioning and mixing; strength of plain concrete in compression, tension and flexure; the expansion and contraction of concrete; fire resistance of concrete; action of salt water on concrete as a protection to metal; adhesion of concrete to steel and iron; a short discussion of the different systems of reinforcing. **LABORATORY.** The following work is required in the Concrete Laboratory: mechanical analysis of the materials for concrete; proportioning and mixing; preparation of concrete specimens for future tests. Second term, Junior year. Two periods per week.

653. **REINFORCED CONCRETE.—RECITATIONS AND LECTURES.** Properties of the materials, general theory, relation of stress intensities on concrete and steel. Varieties of flexure formulas. Shearing stresses, bond stresses, working stresses and construction details. The preparation and use of diagrams and tables. The complete design for a reinforced concrete floor. Laboratory Tests on plain concrete specimens to determine the stress deformation curve in tension and compression. Modulus of elasticity. Tests on reinforced beams to determine deflection and fiber stress distribution, location of neutral axis, and comparison of actual results with those given by various formulas. Text-book—Taylor and Thompson. Third term, Junior year. Two periods per week.

661. **HYDRAULICS.—RECITATIONS.** Hydrostatics, hydraulic instruments, orifices, weirs and tubes. Text-book—Merriman's Hydraulics. **LABORATORY.** Tests are made on the circular orifice, the Venturi meter, water meters and weirs. Third term, Junior year. Three periods per week.

662. **HYDRAULICS.—RECITATIONS.** Pipes; conduits; rivers; water power; dynamics; overshot, undershot and breast wheels; impulse wheels; turbines. Text-book—Merriman's *Hydraulics*. **LABORATORY.** Tests are made on the impulse wheel and the turbine. **FIELD PRACTICE.** Measurements of the flow of the Lehigh River in accordance with the method used by the United States Geological Survey Notes. First term, Senior year. Three periods per week.
663. **HYDRAULICS.—RECITATIONS.** Pipes; conduits; rivers; water-power; dynamics; overshot, undershot and breast wheels; impulse wheels; turbines. Text-book—Merriman's *Hydraulics*. Laboratory tests are made on the impulse wheel and the turbine. First term, Senior year. Three periods per week.
671. **SEWERAGE.—**The disposal of sewage and garbage. The determination of the size and capacity of sewers, inlets and flush tanks. Construction methods. Text-book—Folwell's *Sewerage*. First term, Senior year. Two periods per week.
672. **SEWERAGE DESIGN.—**Design of a sewer system for a small city with map and profiles. Notes. Second term, Senior year. Two periods per week.
681. **WATER SUPPLY.—**The requisites for a good water; the available sources of supply; the construction of pumping plants, reservoirs and pipe lines; purification of water and its distribution to the public. Text-book—Turneure and Russell's *Public Water Supplies*. Second term, Senior year. Two periods per week.
682. **WATER SUPPLY DESIGN.—**Design of a water supply system for a small city. Notes. Third term, Senior year. Two periods per week.
683. **PARK ENGINEERING.—**Lectures on the engineering work involved in park and parkway development. Preliminary surveys; the acquisition of lands; topographical surveys for the use of the landscape architect; the letting of contracts; the preliminary operations of the contractor; drainage and sewerage; grading by hand, excavator, dredge and steam-shovel; pile driving; masonry walls and steps; water-supply systems; paths and drives; lighting. Second term, Senior year. One period per week.

690. **FRAMED STRUCTURES.**—The theory and computation of stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Notes. Third term, Junior year. Two periods per week.
691. **ROOFS AND BRIDGES.**—The theory and computation of stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Railroad bridges under locomotive wheel, excess and equivalent loads. Stress sheets. Notes. First term, Senior year. Two periods per week.
692. **ROOFS AND BRIDGES.**—The theory and computation of stresses in continuous, partially continuous, draw and cantilever trusses. Notes. Second term, Senior year. Two periods per week.
693. **ROOFS AND BRIDGES.**—The theory and computation of stresses in suspension bridges and three-hinged arches. Notes. Third term, Senior year. Three periods per week.
694. **ROOF DESIGN.**—Complete computations and design drawing for a wooden roof truss with bill of materials and cost sheet. Notes. First term, Senior year. One period per week.
695. **BRIDGE DESIGN.**—Complete computations and design drawing of a plate girder for railroad purposes, in accordance with standard specifications. Bill of materials, weights and estimate of cost. Notes. Second term, Senior year. Two periods per week.
696. **BRIDGE DESIGN.**—Complete computations and design drawing of a thorough pin-connected railroad bridge in accordance with standard specifications. Bill of materials, weights and estimate of cost. Notes. Third term, Senior year. Three periods per week.
697. **BRIDGE ERECTION.**—Designing of false work. Erection of a full-weight pin-connected truss bridge. Third term, Senior year. Two days.
698. **GRAPHIC STATICS.**—Analysis of stresses by the force and equilibrium polygons. Application of the equilibrium polygon to the discussion of beams and girders. Analysis of stresses in roof and bridge trusses. Notes. First term, Senior year. One period per week.

699. THESIS.—A thesis is required of every student as a condition of graduation, upon a subject appropriate to and approved by the Department. All laboratories and other apparatus belonging to the Department may be used for thesis purposes. Third term, Senior year. Two periods per week.

MINING ENGINEERING.

Professor Hall and Messrs. Marquard and Hatch.

701. MINE SURVEYING.—Instruments. Location of stations. Underground traversing. Different methods of connecting surface and underground surveys. Mapping. Corrections for top and side telescopes. Surveys of mineral lands and claims. Calculation of ore in sight. Problems in mine surveying. Second term, Junior year. Two periods per week.
711. PROSPECTING.—Physical character of deposits. Geological indications. Prospecting for placer vein and bedded deposits. Preliminary workings. Sampling. Examination and valuation of mining properties. Location of claims and application for patents. Placer and hydraulic mining. First term, Junior year. Two periods per week.
712. DEEP BORING.—Uses and location of bore holes. Rod percussion drilling. American system of rope drilling. Diamond drilling. Special methods: Davis Calyx drill, Mather and Platt's system, Kind's system, hydraulic boring, etc. Survey of bore holes. Shaft sinking by boring. Third term, Junior year. One period per week.
713. BLASTING AND QUARRYING.—Explosives. Tools for boring blast holes, particularly machine rock drills. Determination of size of blast hole and amount of charge. Location of bore holes. Firing, especially by electricity. Slate quarrying. Quarrying of building material. Open mine workings. Third term, Junior year. Two periods per week.
714. SHAFT SINKING, DRIFTING AND TUNNELING.—Excavations. Support of excavations by timber, metal, cement and masonry. Mode of approach and location of opening. Sinking through strata of different kinds. Gangway driving. Special sinking methods; piling, drums, freezing process, Triger's method,

Kind-Chandron system, Lippman's system. First term, Senior year. Two periods per week.

715. EXPLOITATION.—Different systems of coal and metal mining on the surface and underground. Mining machinery. Comparison of methods of development. First term, Senior year. Two periods per week.
716. TRANSPORTATION.—Underground haulage; motors, road-bed, and cars. Rope haulage. Self-acting planes. Surface haulage. Hoisting; motors, ropes, brakes, drums, guides, cages and attachments. Safety appliances. Head frames. Loading and unloading. Signaling. Stocking and storing of ores. Second term, Senior year. Two periods per week.
717. VENTILATION AND LIGHTING.—Atmosphere of mines. Testing the air. Explosions. Natural ventilation. Furnace ventilation. Mechanical ventilation. Instruments for measuring the resistance of airways. Mine fires. Laws. Lighting; different methods. Safety lamps. Electric lighting. Laws. Second term, Senior year. Two periods per week.
718. MINE DRAINAGE.—Mine pumps. Water column pipes. Dumps. Dams. Hoisting water. Drainage tunnels. Siphons. Erection and care of pumping machinery. Third term, Senior year. Three periods per week.
719. MINE CONSTRUCTION.—Graphical and analytical methods for finding stresses. Building materials. Framed structures. First term, Senior year. Three periods per week.
720. ORE DRESSING.—Principle involved. Rock crushers, rolls and stamps. Ore feeders. Classifying machinery. Concentrating machinery, jigs, bridges, tubs, tables and vanners. Magnetic concentration. Amalgamation. Concentrating mills. Third term, Senior year. Four periods per week.
721. ELECTIVE IN MINING.—Problems in mining. Designs for and Reviews of special mining operations. First term, Senior year. Two periods per week.
722. ELECTIVE IN MINING.—Second term, Senior year. Two periods per week.
732. ELECTRIC MINE MACHINERY.—Wiring mines. Lighting Workings. Electric signaling. Electric coal cutters, loco-

- motives, drills, hoists and pumps. Electric blast firing. Electric machinery compared with machinery operated by compressed air and steam. Problems. Third term, senior year. Two periods per week.
741. MINE ADMINISTRATION.—Mine accounts and book-keeping. Organization and management. Employment of labor. Third term, Senior year. Two periods per week.
751. MINING LAW.—Mining laws of the United States. Contracts. Examination and reports. Accidents. Second term, Senior year. Two periods per week.
752. MINE CONSTRUCTION.—Masonry, foundations, retaining walls, etc. Second and Third terms, Senior year. Two periods per week.
753. Trestles, head frames, bridge and roof trusses, on bins, tipples, etc. Third term, Senior year. Two periods per week.
761. THESIS.—A graduation thesis is required of each student who completes the course. This must be an original design or review of some process, machinery or plant related to mining operations. The subject of the thesis is assigned by the department and the thesis must demonstrate the ability of the student to pursue his chosen profession.

ELECTRICAL ENGINEERING.

Professor Rood.

801. ELEMENTS OF ELECTRICAL ENGINEERING.—Ohm's law; laws of resistance; Joule's law; electrolysis; magnetic principles; hysteresis; electrical measuring instruments, storage cells; electrical illuminants; underground and aerial conductors; elementary dynamo construction. First term, Junior year. Five periods per week.
802. ELEMENTS OF ELECTRICAL ENGINEERING.—A continuation of 801. Dynamo magnetic circuit; field and armature windings; characteristic curves; parallel working; boosters, starters and controllers. Second term, Junior year. Four periods per week.
803. ELEMENTS OF ELECTRICAL ENGINEERING.—A continuation of 802. Theories of electrical design; selection, purchase

and maintenance of direct current apparatus and its systems of control. Third term, Junior year. Five periods per week.

804. **ELEMENTS OF ELECTRICAL ENGINEERING.**—A special course designed for students in Civil and Mining Engineering. Electricity and magnetism; electrical measurements; electrical illuminants; lighting systems; dynamos; motors; alternating current machinery, transformers. First term, Junior year. Two periods per week.
805. **ELEMENTS OF ELECTRICAL ENGINEERING.**—A continuation of 804. Installation and operation of electrical machinery; transmission system, alternating current and direct; meters; switchboards; special applications of electricity to mining and civil engineering work. Second term, Junior year. Two periods per week.
811. **ALTERNATING CURRENTS.**—Fundamental principles governing circuits having a variable E. M. F.; effect of resistance, inductance and capacity; generalized Ohm's law. First term, Junior year. Two periods per week.
812. **ALTERNATING CURRENTS.**—A continuation of 811. Alternator regulation; single two- and three-phase circuits; measurement of power in polyphase circuits; theory of the transformer; single and polyphase transformers; methods of phase transformation. Second term, Junior year. Two periods per week.
813. **ALTERNATING CURRENTS.**—A continuation of 813. Polyphase power transmission; line losses; selection of line; induction motors; the rotary converter; special type of A. C. machines. Third term, Junior year. Two periods per week.
814. **ALTERNATING CURRENT CIRCUITS.**—An advanced consideration of alternating current circuits; Fourier's series and its application to A. C. circuits; wave form; wave and vector discussion and analysis; application and use of the complex notation. First term, Senior year. Three periods per week.
815. **MOTOR ENGINEERING.**—A detailed consideration and comparison of the various types of constant and multi-speed direct and alternating current motors, their control, proper fields of use; types and methods of machine drives; power require-

ments of various commercial processes. First term, Senior year. Two periods per week.

821. ELECTRICAL LABORATORY.—Introduction to laboratory methods and practice; measurement of resistances by drop method; insulation test; magnetic leakage; fuses; voltmeter and ammeter calibration by various methods; recording meters. First term, Junior year. Two periods per week, reports.
822. ELECTRICAL LABORATORY.—A continuation of 821. Tests upon arc and incandescent lamps; photometry; magnetization and characteristic curves of dynamos; tests of armature reactions. Second term, Junior year. Two periods per week, reports.
823. ELECTRICAL LABORATORY.—A continuation of 822. Parallel running of generators; investigation of commutator losses; elementary tests with alternating currents; effects of inductance and capacity. Third term, Junior year. Two periods per week, reports.
824. ELECTRICAL LABORATORY.—Motor and dynamo characteristics, A. C. wave form; magnetization and characteristic curves of alternating current generators; efficiency and regulation tests of transformers. First term, Senior year. Two periods per week, reports.
825. ELECTRICAL LABORATORY.—A continuation of 824. Tests of induction and synchronous motors; transformer groupings and resultant ratios; phase transformation; power transmission; transmission losses and efficiencies. Second term, Senior year. Two periods per week, reports.
826. ELECTRICAL LABORATORY.—A continuation of 825. Motor-generator tests; investigation of the rotary converter and its losses and characteristics; dielectric strength of insulating materials; resonance; the oscillograph. Third term, Senior year. Two periods per week, reports.
831. ELECTRIC POWER STATIONS.—A study of the considerations affecting the selection, erection and maintenance of steam and electric power plant machinery, and the assembling of such machinery to form an economical plant for the production

of electric power and light. Second term, Senior year. Four periods per week.

832. HYDRO-ELECTRIC ENGINEERING.—The fundamental principles of hydroelectric engineering; types and forms of powerhouses; the types, proper selection and erection of turbines and governors, generating, switching and transmission apparatus. Second Term, Senior year. Three periods per week.

841. ELECTRIC POWER TRANSMISSION.—Low potential direct and alternating current distributing systems; calculation of losses and drop; house and factory wiring and systems: fire hazards and their prevention; high potential lines, their construction and maintenance; lines and line losses. First term, Senior year. Three periods per week.

842. ELECTRIC RAILROADS.—Systems of distribution; rail-bonds and bond testing; electrolysis; direct current motors and controllers; single-phase commutator motors, train operation and control; speed-time curves. Third term, Senior year. Four periods per week.

851. ELECTRICAL DESIGN.—The design and calculation of rheostats, controllers, wiring systems and machines. First term, Senior year. Two periods per week.

852. ELECTRICAL DESIGN.—A continuation of 851. Design and calculation of advanced types of electrical machinery, generators, motors and transformers. Second term, Senior year. Two periods per week.

861. ENGINEERING ABSTRACTS.—The review and discussion of articles and papers of value in current engineering literature. First term, Senior year. One period per week.

862. ENGINEERING ABSTRACTS.—A continuation of 861. More advanced literature. Second term, Senior year. One period per week.

863. ENGINEERING ABSTRACTS.—A continuation of 862. More advanced literature. Third term, Senior year. One period per week.

871. THE TELEPHONE.—A study of all the modern telephone systems with a review of the earlier systems and development. Third term, Senior year. Three periods per week.

881. ILLUMINATING ENGINEERING.—A review and close study of the modern type of illuminants, gas and electric; photometry and standards of light; candle power distribution; effective illumination; reflectors, shades and globes, their effects and losses; location of lights; wall reflection and absorption. Third term, Senior year. Three periods per week.
891. THESIS.—A thesis is required of every student as a condition for graduation, the topic assigned or approved by the head of the Department. The thesis must show the result of individual investigation and research.

CHEMISTRY AND METALLURGY.

*Professors Hart and Wysor and Messrs. DeLong, Hess
and Taylor.*

901. ELEMENTARY DESCRIPTIVE INORGANIC CHEMISTRY.—Brief course in the chemistry of the non-metals and metals comprising lectures, preparatory work, and recitations. Third term, Sophomore year. Two periods per week.
- 902-3-4. QUALITATIVE ANALYSIS AND QUANTITATIVE ANALYSIS (Begun).—First, second and third terms, Junior or Senior year. Two periods per week.
- 905-6-7.—QUANTITATIVE ANALYSIS.—Elective Course: The work of which is varied to meet the requirements of the student. First, second and third terms, Senior year. Two periods per week.
911. DESCRIPTIVE INORGANIC CHEMISTRY.—Lectures, quizzes and laboratory work. First term, Freshman year. Four periods per week.
912. ADVANCED INORGANIC CHEMISTRY.—The laws of gases. The chemical balance. Diffusion and dissociation. Principles of quantitative analysis. Recitations and laboratory work. Second term, Freshman year. Two periods per week.
913. QUALITATIVE ANALYSIS (Begun).—Third term, Freshman year. Four periods per week.
914. QUALITATIVE ANALYSIS (Continued).—First term, Sophomore year. Four periods per week.

915. QUALITATIVE ANALYSIS (Completed).—Second term, Sophomore year. Four periods per week.
916. QUANTITATIVE ANALYSIS (Begun).—Third term, Sophomore year. Four periods per week.
917. CHEMICAL ARITHMETIC.—Third term, Sophomore year. Four periods per week.
918. QUANTITATIVE ANALYSIS (Continued).—First term, Junior year. Five periods per week.
919. THEORETICAL CHEMISTRY including special determination in the laboratory.—First term, Junior year. Two periods per week.
920. ORGANIC CHEMISTRY (Begun).—First term, Junior year, Three periods per week.
921. ORGANIC CHEMISTRY (Continued).—Lectures, recitations and laboratory work. Second term, Junior year. Three periods per week.
922. ORGANIC CHEMISTRY (Completed).—Third term, Junior year. Four hours per week.
924. THEORETICAL CHEMISTRY (Continued).—Second term, Junior year. Two periods per week.
925. THEORETICAL CHEMISTRY (Completed).—Third term, Junior year. Two periods per week.
926. QUALITATIVE ANALYSIS (Begun) (Shorter Course).—Second term, Freshman year. Two periods per week.
927. QUALITATIVE ANALYSIS (Completed) (Shorter Course).—Third term, Freshman year. Two periods per week.
928. QUANTITATIVE ANALYSIS (Begun) (Shorter Course).—First term, Sophomore year. Two periods per week.
929. QUANTITATIVE ANALYSIS (Continued) (Shorter Course).—Second term, Sophomore year. Two periods per week.
930. QUANTITATIVE ANALYSIS (Completed) (Shorter Course).—Third term, Sophomore year. Two periods per week.
931. QUANTITATIVE ANALYSIS (Continued).—Second term, Junior year. Five periods per week.
932. QUANTITATIVE ANALYSIS (Continued).—Third term, Junior year. Four periods per week.

933. QUANTITATIVE ANALYSIS (Continued).—First term, Senior year. Ten periods per week.
934. CHEMICAL TECHNOLOGY.—Manufacture of "heavy chemicals." First term, Senior year. Two periods per week.
935. CHEMICAL TECHNOLOGY (Continued).—Second term, Senior year. Two periods per week.
951. METALLURGY.—Properties of Metals. Refractory materials and fluxes; furnaces; fuels and thermo measurements; ore dressing; iron and steel. First term, Junior year. Two periods per week.
952. METALLURGY.—Lectures, recitation and laboratory. Second term, Junior year. Two periods per week.
953. METALLURGICAL CHEMISTRY.—Elective. First term, Senior year. Two periods per week.
954. METALLURGICAL CHEMISTRY (Continued).—Elective. Second term, Senior year. Two periods per week.
955. ASSAYING.—Second term, Senior year. Two periods per week.
- 961-2-3. TECHNICAL GERMAN.—Translation of Chemical works from the German. First, second and third terms, Junior year. One period per week.
- 964-5-6. TECHNICAL GERMAN (Continued).—First, second and third terms, Senior year. One period per week.
971. THESIS WORK.—Second term, Senior year. Six periods per week.
972. THESIS WORK. (Completed).—Third term, Senior year. Twelve periods per week.

MECHANICAL ENGINEERING.

Professor Ross.

The work in the shops is intended to render the student familiar with modern shop practice and competent to judge of the quality of machine work, and to enable him in his drawing work to so arrange his design that castings, forgings, and machine work may be done in the most economical manner.

1001. WOODWORKING AND PATTERN MAKING.—Use of hand tools and woodworking machinery. Woodturning. Construction of patterns and core boxes. First term, Sophomore year. Two periods a week for eight weeks.
1002. FOUNDRY.—Moulding, core making, melting and pouring of metal. First term, Sophomore year. Two periods a week for five weeks.
1003. FORGE.—Drawing, upsetting, welding, riveting, tempering, tool making, etc. Second term, Sophomore year. Two periods a week for five weeks.
1004. MACHINE SHOP.—Chipping, filing, and scraping. Construction of machine tools, use of lathes, shaper milling machine, grinding machine, drill and planer. Second term (five weeks) and third term, Sophomore year. Two periods a week.
1010. MECHANISM.—Velocity ratios, method of instant centers, link motions, form of gear teeth, quick return motions, cams, belting, epicyclic trains. Second and third terms, Sophomore year. Two periods a week.
1011. MECHANISM DRAWING.—The application of 1010 in the drafting room. Third term, Sophomore year, one period a week, and first term, Junior year, two periods a week.
1020. MACHINE DESIGN.—The principles involved in the designing of machinery. Friction, shafting, bearings, flywheels, cylin-

drical shells, riveted joints, screens, belting and gearing. First, second and third terms, Junior year. Three periods a week.

1021. MACHINE DESIGN DRAWING.—The application of 1020 in the drafting room. Energy and force diagrams, working drawings of flywheels, shaping, punching, and shearing machines. Second and third terms, Junior year, two periods a week, and first term Senior year, three periods a week.
1022. MACHINE DESIGN.—A shorter course for mining engineers. Combined lectures and drawing room work. Design of gears, flywheels, riveted joints, shafting, keys, etc. First term, Senior year. Two periods a week.
1030. ELEMENTARY STEAM ENGINEERING.—A descriptive course intended to render the student familiar with the various types of steam machinery. Boilers, pumps, injectors, feed water heaters, steam traps, valve gears, reciprocating engines, steam turbines, governors, condensers. Second and third terms, Freshman year. Two periods a week.
1031. STEAM ENGINEERING.—A course similar to 1030, except that a brief treatment of thermodynamics is included. For civil, mining, and electrical engineers. Second term, Junior year. Four periods a week.
1035. THERMODYNAMICS.—The theory of heat, and its applications to engineering. Perfect gases, steam, hot air engines, steam engines, turbines, injectors, refrigerating machines. Second term, Junior year four periods a week, and third term Junior year, two periods a week.
1040. HEAT ENGINES.—The design and construction of the different types of heat engines, including the reciprocating steam engine, steam turbines, air engines, gas engines, oil engines, steam pumps. First, second and third terms, Senior year. Three periods a week.
1041. BOILERS.—The design and construction of steam boilers and accessories. Fuels, corrosion, superheaters, chimneys, feed water heaters, pumps and injectors. First term, Senior year. Three periods a week.
1042. VALVE GEARS.—Zeuner's, Bilgram's and elliptical diagrams.

Forms of slide valves, piston valves, rocking valves, lift valves. Second term, Senior year. Two periods a week.

- 1043. STEAM ENGINEERING CALCULATIONS AND DRAWING.**—The detailed calculations for and design of a steam engine and boiler. Second and third terms, Senior year. One lecture and computation period, and three drawing periods a week.
- 1050. POWER PLANTS.** The design of power plants with a view to maximum economy. Fuels, boiler efficiency, down-draft furnaces, mechanical stokers, coal and ash conveyors, comparative economy of steam engines and turbines, condensers, superheaters, economizers and other auxiliaries, cost of power. Second and third terms, Senior year, Four periods a week.
- 1060. ENGINEERING LABORATORY.**—Calibration of indicators, gauges, etc. Operation of and efficiency tests on engines, boilers, and auxiliaries. First, second and third terms, Senior year. Two periods a week.
- 1070. HEATING AND VENTILATION.**—The theory and practice of modern systems of heating and ventilation. Third term, Senior year. Three periods a week.

GENERAL INFORMATION.

ATTENDANCE.

Attendance on all college exercises is strictly required. Absences on account of sickness, or for other satisfactory cause, may be excused, and leave of absence will be granted at the request of parents when absolutely necessary. In such cases the absence is excused, but the student is invariably required to make up such work as he may lose by reason of his absence. Reports are sent to parents whenever the absences of their sons exceed a reasonable number. In case of the absences becoming excessive, the faculty will punish the neglect with suspension. Absences incurred at the beginning and end of a term, especially if they involve absence from examinations, and immediately preceding and succeeding holidays, are regarded with special disapproval, and under ordinary circumstances will not be excused.

Each student is expected to have at least sixteen recitations each week. Three hours of field or laboratory work are regarded as equivalent to one recitation period. The regular gymnasium drills are also regarded as required exercises as far as prescribed. No student is permitted to take a course involving fewer hours of recitation without a special vote of the Faculty.

EXAMINATIONS.

Examinations are held at the close of each term on the studies of that term, and may be either written or oral, or both, at the option of the professor in charge.



SOUTH COLLEGE.

In addition to these regular examinations, partial examinations and written recitations are held from time to time during the term, with or without notice to the students. Failure to attend an examination, except for reasons of absolute necessity, is regarded as a serious delinquency, and will be dealt with according to the circumstances of each case.

STANDING.

The scholarship of students is determined by the results of the examinations and daily recitations combined.

Students entering with conditions are required to make them up before the end of the term next after that in which they enter.

Students failing to pass in any studies of any term are required to make up such studies before the end of the next term, and they may be specially directed to do so at an earlier date. Students who do not comply with these regulations will be put on probation in scholarship, or lose standing and be only "permitted to recite," or be dropped into the next lower class, as the Faculty may in each case, decide.

Reports of the standing of the students are made to their parents or guardians at the end of each term.

RULES GOVERNING ABSENCES AND RE-EXAMINATIONS.

1. No absence from a recitation, a lecture or a laboratory exercise shall be excused.

2. If the number of a student's absences in any term from the exercises in any subject exceed the number of exercises per week in the subject, but not double the number, he may, at the discretion of the instructor in charge, be debarred from the term examination in the subject, provided the number of absences is not less than three.

If he be debarred, he must pass on the subject before the first day of the next term or repeat the subject with a following class.

3. If the number of a student's absences in any term from any subject exceed double the number of exercises per week in the subject, he must repeat the subject with a following class, provided that the number of such absences must exceed three.

4. If, for special reasons, the head of the department recommend it, the faculty may vote that a student who would otherwise be required to repeat a subject by Rule 3 be given one examination on the subject. If he fails in this examination, he must repeat the subject.

5. Before a student may take the examination provided for in Rule 4, he shall be required to pay to the treasurer of the college a fee of two dollars and show the treasurer's receipt for the same to the teacher in charge of the examination.

6. The instructor in charge of each subject shall, at the beginning of each week, post in some place easily accessible to the students interested, the number of absences from the exercises of the subject of each student to date.

7. All absences shall be reported weekly to the clerk of the faculty, who shall record them.

8. When the number of a student's unexcused and unpermitted absences from the religious and other exercises of the college reaches five, he shall be warned by his class dean; when it reaches ten, he shall be again warned; when it reaches fifteen, he and his parents shall be warned that he is in danger of being dropped from the college rolls; when it reaches twenty, he shall be dropped. If at the end of a term a student has twenty such absences he shall have five absences charged against him on the next term for every five or fraction of five absences above nineteen which stand against him.

PERMITTED ABSENCES.

9. In case of absence due to prolonged sickness or request from home for urgent reasons approved by the dean, the student shall, as soon after the absence as possible, present to the dean a written statement of the cause of his absence, after which the dean shall give the student an exact statement of the duration of his absence, which he shall present to his instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then take it to the dean, and the absences indorsed upon it shall not be counted by the clerk in making up the number of Rule 8.

When such permitted absence causes the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done by the class during as many of these absences as are required to bring his absences below the debarring number by an examination to be held within a month of the absences.

If he fail in this examination, he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before this special examination may be held, the student shall pay to the treasurer of the college a fee of two dollars, and shall show his receipt for the same to the instructor in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

10. When permission to be absent from town has been given to a student by vote of the faculty or by the president acting for the faculty, such student shall receive from the dean an exact statement of the duration of such absence, which he shall present to his instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then return it to the dean and the absences indorsed upon it shall not be counted by the clerk in making up the numbers of Rule 8.

When such permitted absences shall cause the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done during as many of these absences as are necessary to bring his absences below the debarring number by an examination held within a month of the absence.

If he fail in this examination he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before this special examination may be held, the student shall pay to the treasurer of the college a fee of two dollars and shall

show his receipt for the same to the instructor in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

11. If professors, in whose departments a student has the majority of his hours per week, report to the faculty that the student is neglecting his work, he and his parents shall be warned that he is in danger of being dropped from the college rolls. If a second such report be made, he shall be dropped.

RE-EXAMINATIONS.

1. A student who fails at the regular term examination, in any subject, shall be entitled to one re-examination.

2. If, for special reasons, the head of the department recommend it, the faculty may vote that a student who has failed in the re-examination provided for in Rule 1 may be given a second re-examination.

3. Before a student can take the second re-examination provided for in Rule 2, he shall be required to pay to the treasurer of the college a fee of two dollars and show the treasurer's receipt for the same to the instructor in charge of the examination.

4. If, at the beginning of the college year, a student has failed to pass on his conditions of the preceding year in the departments of Mathematics, Mechanics, Physics, French and German, he shall be required to repeat the subjects in which he is still conditioned.

5. When subjects, which closely depend upon each other, are continued through successive terms, the department interested may require that all conditions of any terms in those subjects shall be made up within two weeks from the beginning of the next term, in order that the student may go on with those subjects.

6. All students who have one or more conditions in Freshman English at the end of the third term are required to take English with the incoming Freshman class and to remain in the course till they have satisfactorily passed off their conditions. No re-examinations are given in the course.

7. A student who fails in mathematics in any term of the Freshman year or in the first term of the Sophomore year shall report for re-examination at nine o'clock of the day preceding the first day

of the next term and if he fails to make up his condition he shall take an extra class of two hours per week for one term in the subject in which he failed, said class to rank as a regular part of his schedule of study.

GRADUATION.

Students who have pursued the entire course as prescribed and have successfully passed their examinations are recommended to the trustees for the first academic degree in course. Such recommendations are ordinarily acted upon and the degrees are conferred at Commencement, at which time the students receive diplomas from the President of the College. At Commencement the faculty awards such honors as it sees fit to those who are to receive degrees. These honors ordinarily consist of a valedictory oration, a Latin salutatory, and other honorary orations and theses.

COMMENCEMENT.

The College year is so arranged as to provide a term of 14 weeks immediately before the Wednesday preceding Christmas day and two terms of 11 weeks each after the Christmas vacation, the vacation at Christmas and in the Spring being two weeks each. The annual Commencement usually falls on the third Wednesday in June but occasionally the fourth Wednesday. The three days immediately preceding Commencement day are set apart for special exercises. On Sunday, the first of these days, a Baccalaureate sermon is preached in the College chapel at eleven o'clock in the morning; and in the evening a sermon is preached in the auditorium of Pardee Hall before the Brainerd Society of the College by some distinguished minister selected by the Society.

The preacher for 1910 was Rev. Orton H. Carmichael, of Lebanon, Ind.

On Monday the Senior class holds its Class Day exercises on the campus.

The alumni and literary societies hold their reunions on Tuesday, and orations are delivered before the literary societies in the Society halls.

The regular Commencement exercises are held in the auditorium of Pardee Hall on Wednesday morning, the afternoon being occupied by the alumni dinner. All these exercises are open to the public. Various other exercises of an athletic or social nature are conducted on the part of the students under a general supervision by the faculty.

DEGREES.

THE FIRST DEGREE.—The degree of *Bachelor of Arts* is conferred on the graduates of the Classical Course; *Bachelor of Philosophy*, on those of the Latin Scientific Course; *Bachelor of Science*, on those of the General Scientific Course; *Bachelor of Science* (in Chemistry), on those of the Chemical Course; *Civil Engineer*, on those of the Civil Engineering Course; *Engineer of Mines*, on those of the Mining Engineering Course; *Electrical Engineer*, on those of the Electrical Engineering Course; *Mechanical Engineer*, on those of the Mechanical Engineering Course.

MASTER'S DEGREE.

MASTER OF ARTS.—The degree of *Master of Arts* may be conferred one year after graduation on any *Bachelor of Arts* who has pursued a prescribed course of study, equivalent to sixteen recitations per week, during one year in residence, passed the examinations, and presented a satisfactory thesis.

The same degree may be conferred two years after graduation on any *Bachelor of Arts* who shall have devoted at least one year exclusively to advanced study under the direction of the faculty,

passed examinations in the studies pursued, and presented a satisfactory thesis.

Candidates for this degree must in all cases register on or before October 1st, and examinations must be held at the College at least once in each college term. Theses must be presented for approval not later than May 1st. A registration fee of \$5 and tuition fee of \$100 per annum for residents, and \$45 per annum for non-residents, is exacted of all graduate students.

MASTER OF SCIENCE.—The degree of *Master of Science* may be conferred upon any graduate of the scientific department upon conditions similar to those prescribed for the degree of Master of Arts.

CERTIFICATES.

Students who have been admitted to any department of the College, and have passed satisfactory examinations therein, may obtain certificates of the work which they have done if they have been in attendance not less than one year.

RELIGIOUS INSTRUCTION.

The aim of Lafayette College is distinctly religious. Under the general direction of the Synod of Pennsylvania of the Presbyterian Church its instruction is in full sympathy with the doctrines of that body. At the same time religious instruction is carried on with a view to a broad and general development of Christian manhood within the lines of general acceptance among evangelical Christians, the points of agreement, rather than those of disagreement, being dwelt upon.

Prayers are held each morning in the chapel at 7:50 and religious services in the chapel Sunday mornings at 11 o'clock. All students are expected to attend these services. No exceptions will be made to this rule for morning prayers. Where there is some exceptional

reason assigned by the parents, students will be permitted to attend one of the churches in Easton instead of the Sunday morning service. This permission will be granted only on request of parents and for sufficient reason.

Special sermons are preached before the College from time to time by distinguished ministers. The preachers for 1910 were: Rev. J. Douglas Adam, D.D., East Orange, N. J.; Rev. J. Ramsey Swain, D.D., Philadelphia, Pa.; Rev. Griffin W. Bull, D.D., Scranton, Pa.; Rev. J. Beveridge Lee, D.D., Philadelphia, Pa.; Rev. William Patterson, D.D., Philadelphia, Pa.; Rev. Charles Townsend, D.D., Orange, N. J.; Rev. Charles N. Frost, Bath, N. Y.; Rev. Parke Richards, Waverly, N. Y.; Rev. Charles R. Erdman, Princeton, N. J.; Rev. Francis L. Patton, D.D., Princeton, N. J.; Rev. Charles Lee, D.D., Carbondale, Pa.; Rev. Samuel M. Zwemer, D.D., New York City; Rev. John Monro Gibson, D.D., London, England; Rev. Orton H. Carmichael, Lebanon, Ind.; Rev. Thomas R. Beeber, D.D., Norristown, Pa.; Rev. Samuel A. Martin, D.D., Shippensburg, Pa.; Rev. William I. Stearns, D.D., Westfield, N. J.; Rev. Samuel J. Rowland, D.D., Clinton, N. J.; Rev. John W. Kirk, Danville, Pa.; Rev. Robert Mackenzie, D.D., New York City; Rev. Joseph W. Cochran, D.D., Philadelphia, Pa.; Rev. William Y. Chapman, D.D., Newark, N. J.; Rev. Robert H. Milligan, New York City; Rev. Frederick W. Johnson, D.D., Washington, N. J.; members of the faculty and the local clergy.

The preacher for the Day of Prayer for Colleges, 1911, was Rev. Joseph H. Odell, D.D., Second Presbyterian Church, Scranton, Pa.

Instruction in the Bible has always held a prominent part in the College, and a full account of the courses in Bible study will be found on pages 91-93.

LECTURES.

Special courses of lectures are given annually in connection with several departments and will be found under those departments. A more general course of a popular character is given each year.

TERMS AND VACATIONS.

The College year is divided into three terms, with intervening vacations, as given in the Calendar on page 4. All the classes are examined at the close of each term, and a report sent to the parent or guardian. Students are required to be present punctually at the beginning of each term, and are not allowed during term-time to be absent from town, except by written permission from the Dean.

The Wednesday before the third Thursday of October in each year is observed as Founders' Day, in memory of those who founded the College and of those who have since contributed to its usefulness. On Founders' Day, 1910, an address was delivered by Martin G. Brumbaugh, LL.D., Philadelphia, Pa.

BUILDINGS, LABORATORIES, LIBRARIES.

The College grounds are situated upon the summit of a beautiful hill, overlooking the city of Easton. They are reached by a flight of stone steps, which ascend the bold front of the hill directly from the head of Third Street, or by electric cars, which skirt the face of the hill by a gradual incline. At the head of the steps stands

the monument erected by the alumni association to their comrades who "died for the Union." The grounds contain about sixty acres terraced and laid out under the direction of Donald G. Mitchell. The buildings upon the campus are forty in number. The oldest of these is

SOUTH COLLEGE.

The central portion of this building was erected in 1833 and was the original college building. At later periods east and west wings were added and the whole building was thoroughly overhauled and modernized in 1909. It now contains a large part of the class and lecture rooms for the academic department, and the basement and first floor of the east wing have been fitted for a lecture room and laboratory for the Department of Mining Engineering.

The first and second floors of the west wings are occupied by the College Chapel. The remaining space in the main building and in the wings is devoted to dormitory rooms which have been thoroughly modernized, and every comfort afforded by modern plumbing and sanitary arrangements has been added.

The building has also been beautified by a portico on the south front and by many improvements in the general finish of the building.

The alterations have been intended to secure every needed improvement without altering the general effect of the building. The sentimental value of its historical place in the college life and thought have not been lost sight of.

PARDEE HALL.

The most commanding position on the campus is occupied by this building, the most conspicuous evidence of

the liberality of the late Ario Pardee, which reached to every department of the college. Here the department of civil, mining, and electrical engineering are supplied with thoroughly equipped laboratories and lecture-rooms, and the museums of these departments, and of general geology, mineralogy, and natural history, are to be found. The Ward Library and the handsome rooms of the two literary societies are also in this building, and the central portion of the second and third floors of the main building contains a beautiful auditorium, in which the Commencement exercises, lectures, and other public entertainments are held.

THE VAN WICKLE MEMORIAL LIBRARY.

The Van Wickle Library was dedicated on May 30, 1900. It has given to the College one of the most needed additions to its equipment. A beautiful building of Pompeian brick and terra cotta, thoroughly furnished with the most approved appliances for library work, it is at once a most beautiful and useful feature in the College's development. It contains a large reading room, in which the periodicals and books of most constant reference are to be found; a reference book department; a large room for the general storage of the library; librarian's room; and small rooms for special work.

JENKS BIOLOGICAL HALL.

This building was erected in 1864-'65 by the late Barton H. Jenks, of Philadelphia. It was recently entirely remodeled.

THE GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY,

completed in 1902, is occupied by the departments of

chemistry and metallurgy. The building consists of three stories, and is constructed of Indiana stone, colonial brick, and gray terra cotta. It is fireproof, with steel and cement floors, and gives a thoroughly modern equipment to these departments. This building contains also the Henry W. Oliver Chemical and Metallurgical Library.

THE ASTRONOMICAL OBSERVATORY,

in addition to the Observatory proper, contains a lecture-room, with accommodations for the students in astronomy.

WEST COLLEGE

contains the lecture-room of Dr. Francis A. March and the offices of the registrar and treasurer of the College.

GYMNASIUM.

The importance of physical culture was early recognized by this College and a gymnasium was erected in 1884 and placed under the direction of a competent instructor. At the present time regular drills are required of the Freshman and Sophomore classes four times a week. Optional training in general gymnastics and fencing offered to upperclassmen, and the students are encouraged to participate in such outdoor sports as their physical development fits them for.

The gymnasium is equipped with all the apparatus requisite to physical training, with lockers, bath and dressing-rooms. Before taking part in the gymnasium exercises, or the outdoor sports every student is given a thorough examination, and great care is taken to give each student such exercises as he needs and to avoid any-

thing that would be injurious. In addition to the Director, one of the most able and experienced physicians of Easton acts as consulting physician, and requests for special work or exception from any prescribed work are passed on by the Director and the Consulting Physician. No excuses from the required drills will be granted except upon the recommendation of these officials. A fine athletic field adjoins the campus. It is admirably equipped for athletic contests. Four recent classes erected a commodious field house on it. Here the contests in football, baseball, and track athletics, in which the students have excelled, are held.

No student may take part in any public contest without written permission from his parents previously filed with the Clerk of the Faculty.

THE DORMITORIES.

A complete reorganization of the dormitory system was effected in the summer of 1900 by the building of central structures, known as Knox and Fayerweather Halls, to connect Blair and Newkirk Halls and Martien and Powell Halls respectively, and the facing of the completed buildings with mottled Pompeian brick, handsomely trimmed with red terra cotta. The architectural beauty of the buildings is in marked contrast with the former appearance of the separate building. A complete sanitary plumbing system of baths, sinks, closets and electric lights has been installed in all the buildings. These improvements leave nothing to be desired for the health and comfort of the students.

INFIRMARY.

A building on the extreme northeast corner of the

campus, facing upon McCartney Street, is set apart for the use of sick students, thus securing quiet and complete isolation in case of the occurrence of any contagious disease.

This building is intended solely for the use of students rooming in the College buildings.

BRAINERD HALL.

This building for the Y. M. C. A., the gift of J. Renwick Hogg, Esq., '78, of the Board of Trustees, was erected in 1902. It is a three-story gray stone building in the Tudor Gothic style. It contains a large room for the meetings of the society, and reading, writing, and committee rooms; also a trophy room of the athletic association, a room for the collection of curios from foreign missionary fields, and bowling-alleys in the basement.

Its object is to afford a home under active Christian influences for all forms of student life.

CENTRAL STEAM PLANT.

During the autumn of 1909 a central steam plant was established with a power house built of stone with a concrete roof containing large boiler and storage rooms with every convenience for the running of the plant. The power house is equipped with four 150-horse-power boilers which are sufficient for the present needs of the College and any probable additions for a considerable number of years to come. Provision is also made for the addition of an electric power plant whenever it shall be deemed desirable. This plant is now in full and successful operation and promises to be a great value to the College.

OTHER BUILDINGS.

The remaining buildings consist of a large GREENHOUSE, a useful adjunct to the department of botany, and also supplying flowers and plants for the adornment of the grounds in summer and of the buildings on public occasion. Besides these, a number of buildings are occupied as the HOMES OF THE MEMBERS OF THE FACULTY. The intimate relations resulting from the residence of both faculty and students upon the College grounds are regarded as one of the most wholesome features of the College life.

LIBRARIES AND READING-ROOM.

The main regular College Library occupies the Van Wickle Memorial Library, described above. The College Library was established at the foundation of the College, and has had a steady and uninterrupted growth since 1832, and is chiefly made up of books bearing directly on the courses of instruction. The Ward Library, the gift of the heirs of C. L. Ward, Esq., of Towanda, is largely made up of books of general literature and history and Political Science. Each of the technical departments has also a collection of books, magazines, and other scientific publications in rooms in immediate connection with their lecture-rooms and laboratories. By the gift of \$5,000 Mr. Henry W. Oliver laid the foundation of the H. W. Oliver Chemical Library in the new Gayley Laboratory. The foundation has been added to by gifts from Prof. Edward Hart and others, and the incorporation of the College's collection of chemical works.

A friend of the College has bought and presented to

the Henry W. Oliver Chemical and Metallurgical Library all the pamphlets, about three thousand in number, belonging to the library of the late Prof. Johannes Wislicenus, of the University of Leipsic.

The literary societies, also, have libraries numbering about 6,000 volumes, largely of a literary character, which valuably supplement the more solid libraries of the College.

The College Library contains a papyrus scroll, five feet long, from a mummy at Thebes, with a hieratic inscription—pronounced by Seyffarth the finest he has seen—presented by the late Hon. John Garrett, of Baltimore, of the class of '37, and a collection of prints and medals of General Lafayette presented by the late President William C. Cattell, D.D., LL.D.

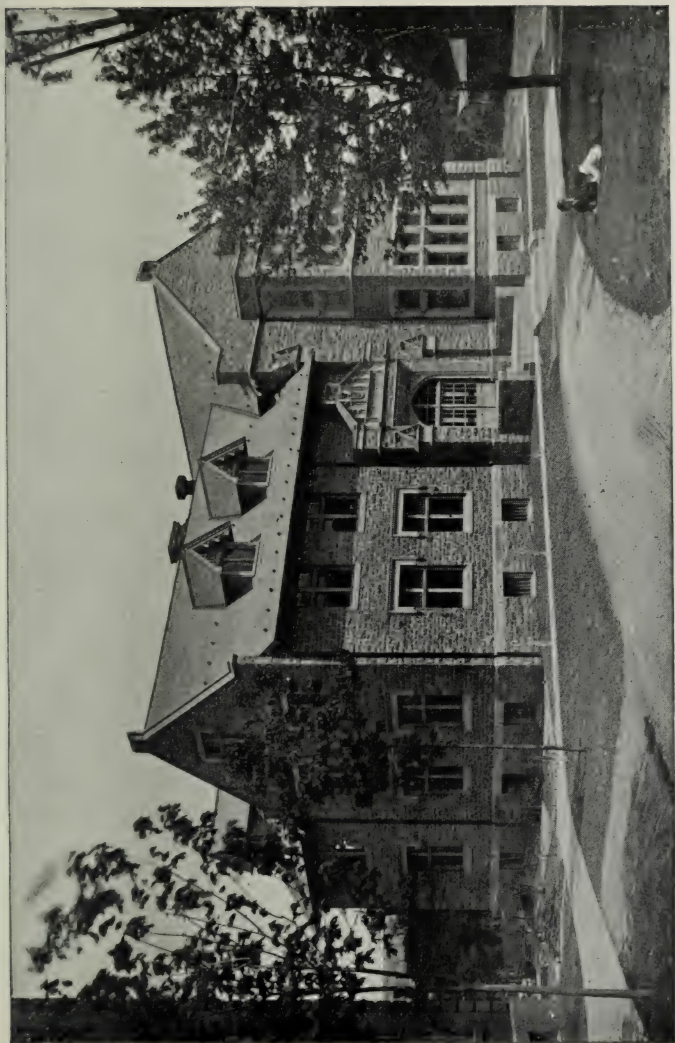
There is also a full-length portrait of Lafayette, by Healey, presented by the late Dr. Thomas W. Evans, of Paris.

ALUMNI ALCOVE.—A collection of books and pamphlets written by the students, alumni, faculty and trustees of the College is being gathered and set apart as a "Lafayette Library" to represent the literary activities of the College. This unique and valuable collection now numbers about 400 volumes, and includes a full set of the College catalogues from 1832 to the present time, the Commencement addresses, and official publications of the College.

The LIBRARIES have received gifts, which are hereby gratefully acknowledged, from the following individuals and institutions:

Individuals:

Dr. E. Stanley Abbott (2); J. Ackerman Coles, M.D. (10); Col. Robert Craig; Edward S. Crockett; D. J. Dery; Herbert Dupuy;



BRAINERD HALL.

W. Gibson Field, Esq. (2); Henry Fink; Joseph B. Greenhut; Mrs. Harriet M. Hance (6); John W. Jordan, LL.D. (2 vol., pamphlet); M. B. Lambert; Rev. T. D. Logan, D.D.; Rev. S. T. Lowrie, D.D. (8); R. Burnham Moffat (2); James H. Moon; Rev. Robert H. Nassau; Hon. A. Mitchell Palmer; Frederick M. Pedersen (pamphlet); Prof. J. M. Porter (2); Miss Mary B. Rohrer, Rev. E. D. Warfield, D.D. (10).

Firms and Institutions:

The Cambridge Bridge Commission; Canada, Dominion Astronomical Observatory; Chicago Association of Commerce; Connecticut Bureau of Labor Statistics; Farmer's Trust Company of Lancaster, Pennsylvania; Harvard University; Iowa Geological Survey; Lafayette Y. M. C. A. Volunteer Band (9); J. B. Lippincott Co.; Naosuka Memorial Committee; A. C. McClurg & Co.; Massachusetts State Board of Health (3); Michigan State Board of Health; Oberlin College; Pennsylvania Society Sons of the Revolution; Pennsylvania State Library (9); Polytechnic Institute of Brooklyn; Presbyterian General Assembly (2); University of Pennsylvania (1 vol., 66 books, pamphlets).

United States Departments:

Geological Survey (27 vols.).

The Class of 1871 has given to the College a fund, the proceeds of which are to be used for the purchase of the publications of the Early English Text Society. The library now contains a large and valuable collection of these.

The class of 1875 at its reunion in 1905 by the gift of one thousand dollars established an alcove in the library to be known as "The Francis A. March Alcove."

The class of 1892 at its decennial reunion in 1902 established an alcove in the library devoted to American literature. Two hundred volumes have been purchased and additions will be made from time to time.

SCIENTIFIC COLLECTIONS.

These are extensive and valuable, and are rapidly increasing from year to year by gifts from societies and individual donors, and by special appropriations in addition to the fees for registration and matriculation.

Among the most valuable of the collections may be mentioned the extensive herbarium, collected by Prof. Thomas C. Porter during forty years of enthusiastic labor; it is especially rich in North America plants and is believed to contain the most complete flora of Pennsylvania in existence and the series of Ward's celebrated casts, illustrating geology and palaeontology.

The apparatus in the department of physics and applied mechanics, the instruments used in the departments of astronomy and engineering, and the scientific equipment of the numerous and extensive laboratories meet the demands of advanced instruction in these departments; a special feature, however, is the series of nine hundred wall charts, executed at the College by Gustave Garnier, under the direction of the professors in the departments of astronomy, chemistry, physics and applied mechanics, metallurgy, and natural history. There are valuable models in machine drawing, stone cutting, crystallography, and architecture.

COLLEGE SOCIETIES.

LITERARY SOCIETIES.

The *Washington* and *Franklin* societies were organized early in the history of the College and are conducted by the undergraduates. Both societies have well-furnished apartments in Pardee Hall, and valuable libraries. They meet every Wednesday evening for literary exercises, consisting of orations, essays, and debates. A generous rivalry for College honors exists between them, and each year representatives of the two societies from the Junior class engage in a public contest in oratory. On the day before Commencement the societies hold reunion meetings in their halls. These societies are an important part of College life and work, and *all the students are strongly advised to join them.*

BRAINERD EVANGELICAL SOCIETY.

The *Brainerd Evangelical Society*, as a society of inquiry, meets each Thursday evening and on the first

Friday of each month in the interest of missions, and for the promotion of Christian effort. Its public anniversary is held on Sabbath evening of Commencement week, at which time a sermon is preached usually by some former members of the Society. In 1910 the preacher was Rev. Orton H. Carmichael, '90, Lebanon, Ind.

BIOLOGICAL SOCIETY.

The *Biological Society* is for the purpose of making its members intelligent concerning the important biological questions of the day, enabling them to appreciate the value of research in nature. The membership consists of those students of the three upper classes who are either prospective or present members of the classes in biology, and of such graduate students as are interested in the laws of life comprehended through the natural history sciences.

CHEMICAL CLUB.

A *Chemical Club* has been organized by the students, for reading and discussing papers contained in the current chemical magazines, and to listen to lectures from visiting chemists.

DEUTSCHER VEREIN.

This Society is organized to promote interest in the German language and literature. Meetings are held fortnightly. Lectures on German life and culture are given at each meeting.

CLASSICAL UNION.

The Classical Union is an association which aims to bring together the students of the culture courses and to

promote the interests of classical study in the College. Lectures on important subjects are given from time to time by members of the faculty and by eminent scholars from other institutions.

EXPENSES.

The tuition is \$100 per annum in all departments. Sons of ministers of the Presbyterian Church and candidates for its ministry receive free tuition in the Classical Course, and are charged one-half tuition in the technical courses.

The other College charges are as follows:

General expenses.....	\$8.00 a term
Library and Reading-room.....	5.00 “
Gymnasium.....	2.00 “

The annual College charges are, therefore, for those who pay tuition in full, \$145.

Entrance Fees.—Each student pays \$5 when he is registered for examination on entering College, and \$10 when he is matriculated, thirty days afterwards. These fees are appropriated in part to the increase of the scientific collections and apparatus. No fees are charged for diplomas.

Laboratories and Fees.—Apparatus for the use of students in the chemical laboratories will be furnished and charged to their account, and the charge canceled for that returned in good condition. Chemicals and all other materials will be charged according to the average cost. A deposit sufficient to meet these expenses is made on entering the laboratories. Members of the classical department are admitted to all the privileges of the laboratories while studying general chemistry,

and, for the present, without charge for the aid of the professor in attendance; each student will, however, pay for chemicals which he uses, and for any apparatus which he may break or injure. In the physical laboratory a fixed charge of \$5 per term is made for supplies and the use of apparatus.

A deposit of \$1 is also made at the begining of each term to pay for public damages, the unexpended balance of which is returned to the student at the end of the year.

Scholarships.—Aid is given to young men of ability, industry, and good moral character who are dependent upon their own efforts for their education. The amount will depend upon the needs of the applicant, but in no case will it exceed the value of the tuition fee in the Classical or Latin Scientific Courses or one-half of the tuition fee in the Technical Courses. No aid is given to students pursuing the General Scientific Course, nor any special or partial courses of study. The aid will not be continued to students who have overdue conditions or whose standing is below the average of their class. Applications for aid should be made to the President before August 1st of each year.

Scholarships offered as prizes in certain schools will be under the same regulations as other aid. The endowed scholarships issued to individuals prior to the establishment of the Scientific Department will provide free tuition in the Classical or Latin Scientific Courses and one-half tuition in the Technical Courses.

BOARD, ROOMS, WASHING.

In all cases the place of boarding must be approved by the Faculty. The price of table board in clubs man-

aged by the students at present averages from \$3.75 to \$4.50 per week. Board, including furnished room, in private families, is from \$4.50 to \$6 per week. Washing costs 40 cents per dozen pieces.

Unfurnished rooms in the College buildings rent for \$8 to \$33 a term; unfurnished rooms adjacent to the College premises for \$12 to \$16 a term, or furnished rooms for \$15 to \$30 a term.

The steam-heated dormitories are lighted by electricity, the cost of which to each of the occupants is \$6 a year. The charge for heating is \$12 a year for each occupant.

Students are expected to room in the College dormitories unless they receive permission to room elsewhere. If they do not occupy College rooms, they are subject to an assessment to meet the loss to the College for rooms left vacant. The reason for this is that the funds of the College have been invested in the dormitories in order to secure cheap and convenient lodgings for the students, and it is to the advantage of all that the buildings should be occupied, the income from the investment being essential to the work of the College, and the students being protected against exorbitant rents.

Information in regard to the selection of rooms can be had from Professor Lyle, inspector of College buildings, the buildings being open for inspection during each term, and three days preceding the first day of each term. Rooms are assigned only to students who have been admitted to College, or who present full certificates from authorized schools, in the order of their application.

College Bills.—College bills must be paid in advance. No student is enrolled for any term until his bill is paid

and a student may be dropped from the roll of the Faculty at any time upon notice from the Treasurer that his college bill is overdue and unpaid. It is the duty of every student to present himself at the Office of the Treasurer at the opening of each term, see that his bill is correct and pay it. Those who wish their bills sent home may have them sent to their parent or guardian if prompt request is made after their bills have been examined and found correct. No bills will be sent home upon a general request, and any neglect of early attention to a college bill will forfeit the right to any extension that would otherwise be granted.

For the convenience of the students it is arranged that payments of the bills shall be made by the Seniors on the first Thursday of each term, by the Juniors on the first Friday, by the Sophomores on the first Saturday, and by the Freshmen on the first Monday. No student is regarded as regularly enrolled for any term until his bill is paid. He may be dropped from the roll for neglect of his bill at any time upon notice from the Treasurer to the faculty. Where it is impossible for a student to pay his bill when due, the Executive Committee has power to extend the payment for a period of not more than thirty days from the beginning of the term. Such extension will only be granted upon written request filed with the Treasurer within ten days after the beginning of each term, giving a satisfactory reason for the extension asked for. A penalty of ten per cent. will be added to every bill remaining unpaid after the expiration of thirty days. No student, whose bill is unpaid, shall be permitted to take the term examinations.

Students entering after the middle of the term shall

pay one-half of the College charges for the term. Students obliged, on account of sickness, to leave before the middle of the term may have refunded to them one-half of the College charges for the term; no reduction will be made to those leaving for any other cause.

Annual Expenses.—Some money for books and other incidental expenses will be needed, but, with close economy, the total annual expenses—exclusive of tuition, clothing, and traveling expenses—need not exceed \$300, as will be seen from the following summary:

	Liberal.	Moderate	Minimum.
General college expenses.....	\$24 00	\$24 00	\$24 00
Charge for College reading-rooms, gymnasiums, etc.....	21 00	21 00	21 00
Board, 36 weeks, at \$3.75 to \$4.50...	160 00	144 00	135 00
Rent of College-room, \$24 to \$99....	99 00	49 00	24 00
Light and fuel.....	18 00	15 00	12 00
Washing.....	25 00	16 00	9 00
Tuition.....	100 00	100 00	100 00
Books and stationery.....	38 00	21 00	16 00
	\$485 00	\$390 00	\$341 00
Deduct for sons of ministers, <i>et al.</i> , in Classical Course			\$100 00
			\$241 00
Deduct for same in other courses.....			\$50 00
			\$291 00
Lowest changes for nec- } essary expenses..... } Classical... ..			\$241 00
Technical... ..			\$291 00

Laboratory fees and damage assessment, which vary in amount, must also be added, while the personal expenses for clothing, etc., must be estimated according to individual experience. The first year will be made more expensive by the fees for registration and matriculation, and furnishings for room; \$300 will therefore be a small allowance.

Parents and guardians at a distance may deposit funds with some member of the faculty, who will pay particular attention to the pecuniary concerns of the student, settling his bills, and transmitting an account of the expenditure, for which services he will charge a commission. It is strongly recommended that parents furnish their sons with little beyond what will meet their necessary expenses.

BEQUEST AND DEVISES.

Each state has special statutory regulations in regard to wills, and it is most important that all testamentary papers be signed, witnessed, and executed in all other respects according to the laws of the state in which the testator resides. In all cases, however, the name of the corporation must be accurately given, as in the following forms:

I give, devise, and bequeath to "Lafayette College," in Easton, Pennsylvania, its successors and assigns forever, the sum ofdollars, to be invested by said corporation in good real estate security, and the interest accruing therefrom to be applied to the support of the Professors in said College.

I give, devise, and bequeath a certain lot situated, etc., to "Lafayette College," in Easton, Pennsylvania, and to their successors and assigns forever, for the uses and purposes of said College, according to the provisions of its charter.

PRIZES.

The following prizes are offered annually:

THE FRANCIS A. MARCH PRIZE IN ENGLISH.

A prize of thirty dollars in books was given from 1862 to 1881 by the late Rev. William C. Fowler, LL.D., of Durham, Connecticut, and since 1881 has been continued by Henry A. Potter, M.S., class of '77, of New York, under the title of "The Francis A. March Prize," upon the following conditions:

"A committee of at least three shall be chosen by the faculty to determine which student of the Senior class has made the greatest proficiency in English philology.

"The decision of the committee is to be made after attending an examination in some English classic, conducted by the professor in English, and after reading essays written by the several members of the class, which shall contain a discussion of the language of some English classic."

The subject in 1911 will be the works of Thackeray.

THE ASTRONOMICAL PRIZE.

A prize of thirty dollars in gold is awarded to the student making the greatest progress in the study of astronomy in the Senior year.

MATHEMATICAL PRIZE.

Two prizes of the value of twenty dollars each are offered in the department of mathematics to those students of the Junior class, one in the Classical and general courses of the scientific department, and one in the technical departments, who shall have exhibited during the first two years of the course the greatest proficiency in the study of mathematics.

These prizes were founded, as was the astronomical prize above mentioned, in 1867, by Professor Traill Green, M.D., LL.D.

THE LOUNSBURY PRIZE IN CHAUCER.

A prize, consisting of books, is given to that student of the Sophomore class who shall present the best essay upon some one of the works of Chaucer. This prize was given in 1896 by Thomas R. Lounsbury, professor of English at Yale University, and will be

continued by friends of the College as the Lounsbury prize in Chaucer.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE.

A prize, consisting of books of the Early English Text Society, of London, is given to that student of the Sophomore class who shall at the close of the Sophomore year pass the best examination in "English before Chaucer." The examination is based upon selected texts announced from year to year, which in 1911 will be from the New Testament.

This prize was founded in 1871.

THE CLASS OF '83 PRIZE.

A prize of the value of fifteen dollars is annually awarded to that member of the Sophomore class who shall have attained the highest standing in his division of the class in Trench on the Study of Words.

This prize was founded by the class of 1883 at their graduation.

COLEMAN BIBLICAL PRIZE.

Three prizes, each of the value of twenty dollars, are awarded to those students of the Freshman class who have attained the highest standing in the several divisions of Biblical study in that year.

These prizes were founded by the Rev. Lyman Coleman, D.D., in 1880.

PRIZES IN ORATORY.

The Washington and Franklin literary societies appropriate one hundred dollars a year for prizes in oratory. Four contestants are chosen from each Hall to take part in the Junior Oratorical Contest, which is held in May. In the presence of a public audience three judges, approved by the faculty, hear the speakers and award the prizes. Their decision is based on the merits of the performances as to originality and force, with reference both to composition and delivery. The first prize is fifty dollars, the second prize thirty dollars, and the third prize twenty dollars.

CIVIL ENGINEERING PRIZE.

A prize of the value of fifty dollars, the gift of Carroll Phillips Bassett, C.E., Ph.D., of the class of 1883, is annually awarded to that member of the graduating class who presents the best graduating thesis and attains the highest standard of scholarship in the Civil Engineering Course.

THE PARK PRIZE IN LATIN.

A prize of fifteen dollars for the Latin Department has recently been founded by Mr. Samuel R. Park, A.M., '84. In 1911 it will be awarded, on the work of the second and third terms Freshman class, for excellence in Horace.

HISTORICAL ESSAY PRIZE.

A prize consisting of a copy of his work, "*The Marquis de Lafayette in the American Revolution*," is given annually by Charlemagne Tower, Jr., LL.D., of Philadelphia, to that member of the Senior class who shall, on or before the first day of October, present the best essay on some subject connected with the relations of *France and the United States*. The essays must not exceed three thousand words in length. The subject for the year 1911 is: "*The Value of the French Alliance in the American Revolution*."

THE CHEMICAL ESSAY PRIZES.

A prize of five dollars in books is awarded each term to that member of the Junior or Senior class who shall present the best term theme on some chemical subject.

THE GILBERT PRIZE IN OLD ENGLISH.

By the will of Howard Worcester Gilbert, who died in Chester County, March, 5, 1895, a bequest was left to the College, with the provision that a gold medal of the value of forty dollars should be awarded every two years to the student writing the best essay on the Old English Language and Literature, beginning with Beowulf, in the earliest Anglo-Saxon period, and extending down to the year 1070. Should the competitors be of equal merit, preference is to be given to residents of Pennsylvania.

The medal is an inch and three-fourths broad, three-sixteenths of an inch thick, and contains on its face a relief portrait of King Alfred with the date 871-901, surmounted by the Anglo-Saxon phrase, "Naes he gold hwaete." The reverse shows a garland encircled with the legend, "Howard Worcester Gilbert Old English Prize. Founded 1895." Space is left for the name of the recipient.

This prize will be awarded at the Commencement of 1911. It is open to competition of students of Anglo-Saxon in the graduate course of 1909-'10 and 1910-'11. The essay must be handed in by May 1, 1911.

'85 PRIZE IN PHYSICS.

The class of 1885 founded a prize in 1897 in the sum of \$500, the annual income of which is given to that member of the Junior class who attains the highest rank in the studies of physics.

THE BLOOMBERGH PRIZE.

The class of 1888, at its decennial reunion, subscribed the sum of \$500, the annual income of which is awarded to that member of the Junior class who shall attain the greatest proficiency in the study of the French and German languages and their literatures.

THE B. F. BARGE GOLD MEDAL.

A prize of a gold medal of the value of \$100 was founded by Benjamin F. Barge, Esq., of Mauch Chunk, Pa., to be awarded to that member of the Senior class who shall deliver the best oration in an annual contest to be held on Memorial Day, May 30th. The contestants, not more than six in number, are to be chosen by a committee of the faculty from those members of the Senior class, who shall hand in orations on or before May 1st upon topics assigned by the committee not later than March 25th of each year.

BARGE MATHEMATICAL PRIZES.

By the bequest of the late Benjamin F. Barge, Esq., of Mauch Chunk, three prizes have been established for excellence in mathematical studies. These prizes will be awarded to members of the Sophomore class for excellence in the solution of original problems.

THE R. B. YOUNGMAN GREEK PRIZE.

The class of 1884, at its vigintennial reunion, subscribed the sum of \$500, the income of which is to be awarded to that member of the Sophomore class who shall attain the greatest proficiency in Greek.

THE NEW SHAKSPERE SOCIETY'S PRIZE.

A prize of books is awarded to that member of the Junior class who passes the best general examination upon Shakspeare, his works, life, character, etc.

NOTE.—In all cases where a prize is awarded to an essay or oration the successful competitor must hand to the proper authority two typewritten copies of his production before receiving the prize, if he is requested to do so.

DEGREES CONFERRED.

HONORARY DEGREES.

June 22, 1910.

DOCTOR OF LAWS.—Hon. J. Franklin Fort, Governor of New Jersey, Hon. D. Newlin Fell, Chief Justice of the Supreme Court of Pennsylvania.

MASTER OF ARTS.—Hon. George Howell, Supt. of Schools, Scranton, Pa.

DEGREES IN COURSE.

June 22, 1910.

BACHELOR OF ARTS.—R. F. Brown, Pa.; W. J. Conrad, Pa.; J. F. Crater, Jr., Pa.; J. H. Dalrymple, N. J.; J. S. Dauerty, Pa.; R. L. Ely, Pa.; O. C. Fay, Pa.; W. B. Hindman, O.; T. C. Jeffery, Pa.; A. E. Keiber, Pa.; H. R. Koehler, Pa.; D. W. Lusk, N. J.; F. C. McCutcheon, Pa.; R. E. McPherson, Pa.; W. C. Masonheimer, Pa.; T. O. Mitman, Pa.; C. E. Steinheiser, Pa.; P. A. Swartz, N. Y.; R. A. Torrey, Jr., Pa.; N. C. Uhler, Pa.; R. I. Walter, Pa.; R. L. Ware, Pa.; M. K. Yorks, Pa.

BACHELOR OF PHILOSOPHY.—G. C. Baker, Pa.; I. Coons, Pa.; A. Y. Deisroth, Pa.; A. P. Hays, Pa.; D. A. Herrick, N. Y.; A. F. Kahn, Pa.; H. W. Markle, Pa.; N. R. Miller, Pa.; J. F. A. Moore,

N. Y.; A. H. Myers, N. J.; J. S. Noble, Pa.; J. O. Parker, Pa.; J. H. Zerbey, Pa.

BACHELOR OF SCIENCE.—J. Cawley, Pa.; G. R. Kreider, Jr., Pa.; D. L. Swank, Pa. (Oct. 26).

CIVIL ENGINEER.—J. J. Durfee, N. Y.; B. Hotchkiss, D. C.; G. W. Hunt, N. J.; F. E. Hutton, N. Y.; F. H. Irmschler, Pa.; F. M. Johnson, Pa.; A. H. Schaaf, Md.; L. T. Southwick, N. Y.; G. A. Wellman, N. Y.

ELECTRICAL ENGINEER.—G. F. Alrich, Pa.; P. M. Arndt, N. J.; J. B. Cline, N. J., W. Crawford, Pa.; S. L. Cunningham, Pa.; W. T. Edgell, Pa.; W. F. Goodwin, N. J.; R. S. Metzgar, N. J.; F. W. Royer, Pa.; A. T. Warner, N. J.; C. P. Woodnutt, Pa.

MINING ENGINEER.—A. A. Blaicher, N. J.; W. W. Darsie, Pa.; M. R. Evans, Pa.; R. F. Gies, Pa.; A. R. Gordon, N. Y.; G. S. McCaa, Pa.; H. T. Updegrave, Pa.

BACHELOR OF SCIENCE IN CHEMISTRY.—J. B. Darlington, Pa.; A. B. Judson, Pa.; D. Rankin, Pa.; D. W. Rial, Pa.; E. C. Taylor, Pa.; H. T. Updegrave, Pa.

MASTER OF ARTS.—J. W. Scroggs, '75.

MASTER OF SCIENCE.—C. F. F. Garis, '03; W. T. Foster, '06.
Total—First Degree, 72.

COMMENCEMENT DISTINCTIONS, 1910.

HONORS.—George Frederick Alrich, Easton; John Cawley, Springtown; John Hart Dalrymple, West Orange, N. J.; Philip Allen Swartz, Poughkeepsie, N. Y.

ORATIONS.—George Calvin Baker, Noxen; John Boyer Cline, Stewartsville, N. J.; William Fogg Goodwin, Bridgeton, N. J.; Arthur Rand Gordon, West Hampton, N. Y.; Thomas Cowling Jeffery, Pen Argyl; Albert Barnes Judson, Meshoppen; Arthur Emanuel Keiber, Drums; Robert Eton McPherson, New Bloomfield; Harry R. Koehler, Hazleton; Warren John Conrad, Reading; John Francis A. Moore, Hornell, N. Y.; Arthur Henry Myers, Somerville, N. J.; Donald Rankin, Scranton; David Weimer Rial,

Greensburg; Robert Lothrop Ware, Easton; John Henry Zerbey, Jr., Pottsville.

PRIZES AWARDED.

SENIOR PRIZEMEN.

THE FRANCIS A. MARCH PHILOLOGICAL PRIZE: Philip A. Swartz, Poughkeepsie, N. Y.

THE ASTRONOMICAL PRIZE: John Cawley, Springtown, Pa.

THE BASSETT PRIZE IN CIVIL ENGINEERING: First prize, divided equally between Louis T. Southwick, New York, N. Y., and George A. Wellman, Covington, N. Y. Second prize, divided equally between Burton Hotchkiss, Washington, D. C., and Floyd M. Johnson, Covington, Pa.

THE CHEMICAL ESSAY PRIZES: Joseph B. Darlington, West Chester, Pa.

B. F. BARGE GOLD MEDAL PRIZE: J. F. A. Moore, Hornell, N. Y.

JUNIOR ORATORICAL PRIZES.

Franklin Hall.

William Aston.
Raymond S. Hittinger.
Jacob S. La Rue.
Jesse L. Parsons.

Washington Hall.

Edward R. Barnard.
Paul Hutchinson.
Charles B. Swartz.
William Warfield.

FIRST PRIZE: Edward R. Barnard, Hamilton, Ontario.

SECOND PRIZE: Jacob S. La Rue, Glenmore, N. J.

THIRD PRIZE: Paul Hutchinson, Bayonne, N. J.

THE CLASS OF '85 PRIZE IN PHYSICS: Clarence E. Feick, Reading.

THE BLOOMBERGH PRIZE IN MODERN LANGUAGES: Clarence E. Feick, Reading.

JUNIOR PRIZEMAN.

THE SHAKESPEARE PRIZE: Charles B. Swartz, Poughkeepsie, N. Y.

SOPHOMORE PRIZEMEN.

THE CLASS OF '83 PRIZE IN ENGLISH: William G. Simpson, Elizabeth, N. J.

THE TRAILL GREEN PRIZE IN MATHEMATICS: Howard L. Benson, Washington, D. C.; Ralph W. Brown, Washington, D. C.

THE B. F. BARGE MATHEMATICAL PRIZES:

FIRST: Harold D. Beatty, Hoboken, N. J.

SECOND: Walter C. Barnes, Perth Amboy, N. J.

THIRD: Atcheson L. Hench, Pittsburg, Pa.

THE LOUNSBURY PRIZE IN CHAUCER: Maurice C. Wilson, Woodland, Pa.

THE R. B. YOUNGMAN GREEK PRIZE: William G. Simpson, Elizabeth, N. J.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE: William G. Simpson, Elizabeth, N. J.

FRESHMAN PRIZEMAN.

THE LYMAN COLEMAN BIBLICAL PRIZES.

DIVISION A: Adam B. Caldwell, Williamsport, Pa.

DIVISION B: Michael Frasca, Philadelphia, Pa.

DIVISION C: John C. Kielman, Portsmouth, O.

DIVISION D: William A. Lynahan, Corning, N. Y.

DIVISION E: J. Leo Rothchild, Brooklyn, N. Y.

DIVISION F: David B. Skillman, Philadelphia, Pa.

THE PARK PRIZE IN LATIN: William N. Wysham, Baltimore, Md.

CLASS MONITORS.

Appointed for general excellence in study:

SENIOR CLASS: C. B. Swartz.

JUNIOR CLASS: H. L. BENSON.

SOPHOMORE CLASS: J. I. Henshaw.

FRESHMAN CLASS: E. S. Chandler and E. C. Watson.

THESES PRESENTED BY CANDIDATES FOR DEGREES IN THE TECHNICAL COURSES OF THE PARDEE SCIENTIFIC DEPARTMENTS.

1. An Investigation of the Stress Distribution in Reinforced Concrete Beams.

JOSEPH JAY DUFEE, Covington, N. Y.

GEORGE WEBSTER HUNT, Riegelsville, N. J.

FRANK HENRY IRMSCHLER, Easton.

FRANK HENRY KELLEY, Reedsville, N. Y.

2. Study of the Flow of the Delaware River.
BURTON HOTCHKISS, Washington, D. C.
FLOYD MYRON JOHNSON, Covington.
3. Stress-Distribution in the Web and Flanges of a Plate Girder.
FRANK ELISON HUTTON, Kingston, N. Y.
AUGUST HENRY SCHAAF, Baltimore, Md.
4. The Effect of Clay on Portland Cement Mortars.
LOUIS THURSTON SOUTHWICK, New York, N. Y.
GEORGE ALBERT WELLMAN, Covington, N. Y.
5. Calculation and Rate of Flow of the Delaware River at Easton, Pa.
ARTHUR AUGUSTUS BLAICHER, Newark, N. J.
6. Review of the Palmer Shaft of the New Jersey Zinc Co., at Franklin Furnace, N. J.
WILLIAM WALKER DARSIE, Pittsburg.
7. A General Treatise on Mine Ventilation.
MILTON RUTHERFORD EVANS, Plymouth.
GEORGE SHIFFER MCCAA, Plains.
8. Review of Winding at the Cranberry Mine and at No. 40 Shaft at Hazleton, Pa.
ARTHUR RAND GORDON, West Hampton, N. Y.
REUBEN FRANK GIES, Easton.
9. The Comstock Lode, Virginia City, Nev., with a Review of the Drainage and Mining Methods Employed in the Yellow Jacket Mine.
HARRY TAYLOR UPDEGROVE, Easton.
10. The Sodium Potassium and Lithium Salts of Para-sulfo-meta-amido-benzoic Acid.
HARRY TAYLOR UPDEGROVE, Easton.
11. Notes on Physical and Chemical Testing of Alloy Steel.
DAVID WEIMER RIAL, Greensburg.
12. The Distillation of Nitric Acid.
DONALD RANKIN, Scranton.
13. Meta-nitro-para-sulfo-benzoic Acid.
ALBERT BARNES JUDSON, Meshoppen.
14. Dithiophene.
JOSEPH BENSON DARLINGTON, West Chester.
15. Dinitro-sulfo-phenol.
ELMER CLAYTON TAYLOR, Cold Spring.

16. An Investigation of the Effects of Tension on the Magnetic Properties of Cast Iron, Wrought Iron and Mild Steel.
GEORGE FREDERICK ALRICH, Easton.
WILSON CRAWFORD, Summit Hill.
17. An Investigation of the Choice of Gear Ratio for a Certain Interurban Electric Railway.
PAUL MITCHELL ARNDT, Phillipsburg, N. J.
RAYMOND STANLEY METZGAR, JR., Phillipsburg, N. J.
18. Test of a Motor Generator Set.
JOHN BOYER CLINE, Stewartsville, N. J.
WILLIAM FOGG GOODWIN, Bridgeton, N. J.
19. A Study and Investigation of the Christian Street Station of the Philadelphia Electric Company.
SPRINGER LAWRENCE CUNNINGHAM, Pittsburg.
WILLIAM THOMAS EDGELL, Wilkes-Barre.
20. Dielectric Strength of Insulating Materials.
FRANK WEIMER ROYER, Greensburg.
21. Test of An Experimental Rotary Converter.
ARTHUR TRUMBULL WARNER, Orange, N. J.
CHARLES PRESTON WOODNUTT, Williamsport.

THE ALUMNI ASSOCIATION.

The Alumni Association is composed of graduates of the College and such former students as left College before graduation, in good standing, as may be elected. The annual meeting is held on Tuesday, preceding Commencement Day.

The Association has the privilege of choosing, every alternate year, two members of the Board of Trustees, who hold office for six years. In June, 1910, A. C. Overholt, '84, of Scottdale, Pa., and Wayne Dumont, '92, of Paterson, N. J., were chosen. In the Spring of 1912 two more will be voted for.

The Executive Committee is as follows: McCluney Radcliffe, M.D., '77, Chairman, Philadelphia; A. C. Campbell, '84, Wilkes-Barre; Robert F. Whitmer, '85, Philadelphia; Fred R. Drake, '86, Easton; James W. Fox, '88, Easton; J. F. Valient, '99, New York, N. Y.

It is desirable to keep up the full record, so long maintained, of the residences, occupations, literary efforts, and public services of the alumni and former students of the College.

Information is solicited in regard to these points, and also in reference to matters appropriate to the obituary record, which is annually prepared for the alumni association.

Each alumnus is asked to send his personal record, carefully revised to date, to the secretary before May 1, 1911.

LOCAL ASSOCIATIONS.

ALUMNI ASSOCIATION OF LAFAYETTE.

JAMES MADISON PORTER, '86, Easton.....*President*
 CHARLES B. ADAMSON, '77, Philadelphia.....*Vice-President*
 REV. J. F. STONECIPHER, D.D., '74, Easton....*Sec. and Treasurer*

THE LAFAYETTE ALUMNI ASSOCIATION OF NORTH-EASTERN PENNSYLVANIA.

FRED C. KIRKENDALL, '94, Wilkes-Barre.....*President*
 OSCAR J. HARVEY, '71, Wilkes-Barre.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF PHILADELPHIA AND VICINITY.

THOMAS FISHER, '88*President*
 CHARLES B. ADAMSON, '77, 76 East Logan St., Germantown, Phila.
*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF NEW YORK AND VICINITY.

WAYNE DUMONT, '92, Paterson, N. J.....*President*
 JOHN F. VALIENT, 165 Broadway, New York, N. Y....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF THE WEST BRANCH.

FRED. H. PAYNE, '88, Williamsport.....*President*
 R. FLEMING ALLEN, '90, Williamsport.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF CENTRAL PENNSYLVANIA.

REV. A. N. HAGERTY, '81, Carlisle.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF WESTERN PENNSYLVANIA.

EDWARD C. CHALFANT, '95, Pittsburg.....*President*
 HENRY LLOYD, JR., '03, 933 Penn Ave., Pittsburg.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF MARYLAND

ROBERT H. SMITH, '67, 53 St. Paul Street, Baltimore.....*President*PEARCE KINTZING, M.D., '81, Baltimore *Secretary*THE LAFAYETTE ALUMNI ASSOCIATION OF CHICAGO
AND VICINITY.NATHAN GRIER MOORE, '73, Chicago.....*President*

TRACY D. LUCCOCK, '05, 815 Kenilworth Ave., Oak Park, Ill.

.....*Secretary*THE LAFAYETTE ALUMNI ASSOCIATION OF THE NORTH-
WEST.HON. JAMES T. HALE, '77, Duluth, Minn.....*Secretary*THE LAFAYETTE ALUMNI ASSOCIATION OF WASHING-
TON, D. C.SNOWDEN ASHFORD, '88, 918 Farragut Square.....*President*ELI SWAVELY, '96, Connecticut Ave., Washington, D. C..*Secretary*THE LAFAYETTE ALUMNI ASSOCIATION OF NEW JER-
SEY.WAYNE DUMONT, '92, Paterson, N. J.....*President*

FREDERICK F. KENNEDY, '98, 774 Broad Street, Newark,

N. J.....*Secretary*

ASSOCIATION OF ST. LOUIS AND THE SOUTHWEST.

REV. C. L. CHALFANT, '89, St. Louis.....*President*H. P. G. COATES, '92, St. Louis..... *Secretary*

STUDENTS.

GRADUATE STUDENTS.

S. B. Gilhuly, A.M., N. J.....	History and English Literature, Lafayette, '86.
J. B. Hench, A.M., Pa.	Latin, Lafayette, '83.
Allan Roberts, Ph.B., M.S., Pa....	History and Political Science, Lafayette, '99.
W. M. Smith, Ph.B., Pa.....	Mathematics and Astronomy, Lafayette, '03
William H. Kirkpatrick, A.B., Pa..	History and Political Science, Lafayette, '05
Carmon Ross, Ph.B., Pa.....	Modern Languages, Lafayette, '05.
Leo A. Gates, A.B., Pa.....	Latin and English, Lafayette, '08.
Cyrus H. Williston, B.S., N. J....	Chemistry and Biology, Lafayette, '08.
Howard B. Bartolet, A.B., N. J....	Mathematics and Physics, Lafayette, '08.
E. Welles Coffin, A.B., Pa	History and English, Lafayette, '07.
Harry Daniel Bailey, A.B., Pa.....	Botany, Zoology, and Geology, Lafayette, '04.
E. Graham Wilson, A.B., N. Y....	Psychology and Philosophy, Lafayette, '07.
John Royden Hess, Ph.B., Pa.....	Chemistry, Lafayette, '07.

GRADUATES..... 13

SENIOR CLASS, 1911.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
James Hezekiah Allen.....	L.....	Kenton, O.....	135 F.
Henry Bunn Anderson.....	Ch.....	Bloomsbury, N. J....	Home
William Aston.....	C.....	Wilkes-Barre.....	43 S.
Allen Eugene Bacon.....	L.....	Wilkes-Barre.....	94 McK.
Edward Raymond Barnard....	C.....	Hamilton, Ontario....	Brd.
Lawson Henry Bauer.....	Ch.....	Mertztown.....	91 McK.
Harry Edwin Beadell.....	Ch.....	Easton....	1028 Lehigh St.
Frederick Heman Beeman	E.E....	Union, N. Y.....	37 S.
Charles Robert Bellamy.....	Ch.....	Scranton.....	79 N.
Frederick Luther Bentley....	Ch.....	Camden, N. J.....	161 E.
Roscoe Conklin Berlin.....	E.M....	Slatington....	Geo. Simon's
Charles Knilsey Boas.....	E.E....	Harrisburg.....	Δ K E
Van Tuyl Boughton.....	C.E....	Valley Falls, N. Y.	122 McC.
Floyd Thomas Bower.....	C.....	Wind Gap.....	Home
John George Boyd.....	L.....	Canaseraga, N. Y....	61 B.
Robert Albert Christman.....	L.....	Kresgeville.....	33 S.
John Boyer Cline.....	C.E....	Stewartsville, N. J...	Home
Myron Judson Conover.....	E.M....	Matawan, N. J.....	Δ K E
William Daniel Conrad.....	C.E....	Reading.....	101 McK
Harold Croasdale.....	Ch.....	Delaware Water Gap,	113 McK.
Donald Van Lear Downs.....	C.E....	Dover, Del.....	Δ K E
George Bache DuBois.....	C.E....	Washington, D. C.....	X \emptyset
Henry Wilmot Eckel.....	C.E....	Washington, N. J....	\emptyset Δ θ
Robert Moore Eyster.....	E.M....	Chambersburg.....	\emptyset K Ψ
Clarence Edgar Feick.....	L.....	Reading.....	99 McK.
Theodore Sands Fillmore†....	C.E....	Shickshinny.....	Δ K E
Edwin Clyde Foresman.....	C.....	Ford City.....	130 M.
Rollin Proctor Gilbert.....	Ch.....	Camden, N. J.....	81 N.
Philip Lyman Hand†.....	C.....	Wilkes-Barre.....	Z Ψ
Horace Morgan Hess.....	C.....	Phillipsburg, N. J.,	11 Kroner's Block
Max Hirsch.....	G.S....	Pittsburg.....	111 McK.
Raymond Solt Hittinger.....	C.....	Easton.....	322 N. 12th.
Samuel Goodman Hoffenstein	L.....	Wilkes-Barre.....	94 McK.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Oliver Alexander Horner.....	E.E....	Emmitsburg, Md.....	69 B.
William Patrick Howard.....	E.E....	Duquesne.....	Φ K Ψ
Nicholas Van Reed Hunter....	E.M....	Wyncote.....	Z Ψ
Paul Hutchinson.....	L.....	Bayonne, N. J.....	61 B.
Edward Huntting Jones.....	C.....	East Hampton, N. Y....	Brd.
Omar Harrison Keller.....	L.....	Doylestown.....	151 P.
William Cummings Kidd.....	C.....	Philadelphia.....	41 S.
Floyd Johnson Kintner.....	C.....	Easton.....	1001 Butler
Jeremiah Alexander Klotz....	C.....	Northampton....	107 McK.
Hans Heinrich Kudlich.....	E.M....	Drifton.....	134 M.
Jacob Servus LaRue.....	C.....	Glenmore, N. J.....	36 S.
Martin Hoffman Lindabury....	E.E....	Frenchtown, N. J....	87 N.
John Sheridan Linn.....	C.....	Paoli.....	43 S.
Lester Long.....	C.E....	Summit, N. J.....	Φ Δ Θ
Samuel Bingham Luccock....	L.....	Oak Park, Ill.....	Θ Δ X
George McCahon.....	C.....	Kilrea, County Derry, Ireland, 37 S.	
Henry Stanley McGarrah.....	E.E....	Scranton. 1440 Washington	
Audley Lytle Mabon.....	C.....	Indiana.....	Φ K Ψ
Walter Ingham Macaulay....	E.E....	Phillipsburg, N. J., 411 S. Main	
Philip Maue.....	E.M....	Hazleton.....	29 S.
Walter Henry Mechler.....	L.....	Jenkintown.....	50 S.
Ambrose Frederick Melan†....	L.....	Wilkes-Barre.....	97 McK.
Arthur Richards Miller.....	E.E....	Holland, N. J.....	87 N.
Frederich Adolphus Miller....	L.....	Madison, N. J.....	Θ Δ X
Harry Worthington Mixsell...C.E....		Phillipsburg, N. J....	Home
James Arthur Moore.....	E.E....	Panama.....	709 High
Ralph Clark Nash.....	E.E....	Warren, Ohio.....	Z Ψ
Jesse Spencer Parsons.....	L.....	Media.....	169 E.
Clarence Gammill Peattie....	E.M....	Saratoga Springs, N. Y., 2 X	
William Walter Perry.....	E.E....	Easton.....	137 So. 13th
Stewart Rice Race.....	C.....	Cornish, N. J.....	115 McK.
Carl Seib Rankin.....	C.E....	Scranton.....	113 McK.
James Henry Reeder†.....	C.E....	Hughesville.....	27 S.
Archibald Murray Richmond..C.....		Boonton, N. J.....	99 McK

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
John Oswald Rinck.....	E.M....	Easton.....	422 Reeder
John Rosenberry Rosen- berry, Jr.....	E.E....	Easton.....	48 S.
Jesse Earl Schelling.....	E.E....	Phillipsburg, N. J., 213 Chambers	
Irvin Schick.....	E.M....	Hazleton.....	51 S.
Leon Moyer Schwenk.....	L.....	Perkasie.....	X ϕ
Frank Carrie Shand.....	E.E....	Kingston, N. Y....	134 M.
Christian Ludewig Siebert.....	G.S....	Pittsburg.....	137 F.
Guy Fuller Smith.....	E.M....	Camptown.....	709 High
James Robeson Smith.....	E.M....	Belvidere, N. J....	105 McK.
Arthur Dodd Snyder.....	C.....	Easton.....	15 So. 11th
Bernice Yorgey Spare.....	C.....	Limerick.....	36 S.
John Elmer Stellwagon.....	L.....	Easton.....	699 Ferry
Elijah Compton Stewart.....	C.....	Alexandria.....	2 X
Archibald Styer.....	C.E....	Burlington, N. J....	89 N.
Charles Benjamin Swartz.....	C.....	Poughkeepsie, N. Y..	131 M.
Ernest Mortimer Tuttle.....	C.....	Newark, N. J.....	ϕ K \mathcal{T}
Harry Walter Vetter.....	C.E....	Belvidere, N. J....	105 McK.
William Warfield.....	C.....	Easton.....	
		Chestnut and McCartney	
William Lambertson White, Jr	C.E....	Easton.....	
		East Ave. and Monroe	
Joseph Horton Williams.....	E.M....	Wellsboro.....	77 K.
Edmond Talmage Witt.....	C.....	Jemerstown.....	33 S.
Clarence Ray Wolf.....	C.....	Highspire.....	107 McK.
Robert Woodcock.....	E.M....	Holidaysburg.....	2 X
SENIORS.....			90

JUNIOR CLASS, 1912.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Charles Matthaei Addis.....	Ch.....	Newark, N. J.....	X Ø
Edward Leslie Bacon.....	C.....	Bridgeton, N. J.....	.88 N.
Walter Amberson Barnes.....	E.M.....	Pittston.....	.71 B.
Harold Dumont Beatty.....	L.....	Hoboken, N. J.....	108 McK.
Howard Livingstone Benson.....	E.E.....	Washington, D. C.....	108 McK.
Howard Milton Bliem.....	E.E.....	San Antonio, Tex.....	—
Ross Herman Boas.....	E.M.....	Harrisburg.....	Δ K E
Benjamin Ray Brown.....	C.E.....	Honesdale.....	145 P.
Ralph Waldo Brown.....	E.M.....	Washington, D. C.....	150 P.
Milton Oliver Cederquist.....	Ch.....	Titusville.....	Ø Δ Ø
Philip Lewis Cook.....	C.....	Wyalusing.....	.44 S.
William Everett Crater, Jr.....	L.....	Easton.....	.440 Ferry
Herman Anson Dann.....	L.....	Titusville.....	X Ø
William Franklin Danne-			
hower, Jr.....	L.....	Norristown.....	Ø K Ψ
David Davis.....	L.....	Summit Hill.....	173 E.
George R. Kaercher Day.....	E.E.....	Hazleton.....	Ø Δ X
Ralph Emerson DeKay.....	C.....	Florida, N. Y.....	.34 S.
James Blair Easter.....	C.E.....	Pittsburg.....	Δ K E
William Francis Farrell.....	L.....	Wilkes-Barre.....	122 McK.
George Benjamin Fillmore.....	E.E.....	Shickshinny.....	Δ K E
Harold Wilson Furness.....	C.....	Philadelphia.....	102 McK.
Albert James Graham.....	E.E.....	Easton.....	201 Burke
Jonathan Parsons Greenleaf.....	C.....	Branchville, N. J.....	127 M.
Harold Fetter Grim.....	C.....	Ottsville.....	147 P.
Kenneth Cushing Grinslade.....	Ch.....	Leonida, N. J.....	Ø K Ψ
Floyd Johnson Hann.....	L.....	Phillipsburg, N. J.,	
		57 Filmore	
Atcheson Laughlin Hench.....	C.....	Pittsburg.....	149 P.
Donald Wilson Henry.....	C.....	Athens.....	.62 B.
William Vilas Hill.....	C.E.....	Bordentown, N. J.....	.89 N.
Wilmer Jacob Hindenach.....	C.....	Durham.....	Home
George Maurice Hohl.....	L.....	Easton.....	214 Bushkill
John Eilenberg Howell.....	G.S.....	Jersey City, N. J.....	X Ø
Robert Carter Howell.....	E.E.....	Harmony, N. J.....	Home
Marshal Hunt.....	C.....	Sussex, N. J.....	.82 N.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Harry Richard Jahn.....	Ch.....	Brooklyn, N. Y.....	———
Elmer Lyon Jones.....	C.E.....	Scranton.....	95 McK.
Paul Schell Kantner.....	L.....	West Easton.....	Main St.
Michael Joseph Kasprzak.....	C.....	Perth Amboy, N. J.....	171 E.
Merlin Joe Kilbury.....	G.S.....	Hornell, N. Y.....	27 S.
Jacob Vanderbilt Koontz.....	C.....	Baltimore, Md.....	34 S.
John David Lindsay.....	C.....	Wilmington, Del.....	35 S.
Harry Aaron Lipson.....	L.....	Newark, N. J.....	85 N.
Harold John Lockwood.....	E.E.....	Newton, N. J.....	69 B.
Irving Kennedy Lovett.....	L.....	Red Bank, N. J.....	122 McK.
Russell McCauley.....	C.....	Altoona.....	Φ Δ Θ
Kemper Grier McComb.....	C.....	Haddonfield, N. J.....	115 McK.
Walter Walbridge McComb†.....	L.....	Tarentum.....	Φ K Ψ
George Edward McElroy.....	E.M.....	Easton.....	207 Burke
Edward Heller Maier.....	C.E.....	Bridgeton, N. J.....	88 N.
Frank Louis Napoleon Mayer.....	E.M.....	Washington, D. C.....	———
Robert Walton Mumma.....	E.E.....	Steelton.....	109 McK.
Harry Clayton Murphy.....	C.....	Vandergrift.....	X Φ
Chester Arthur Murtaugh.....	C.E.....	Easton.....	60 S. Front
Agha Buzurkkhan Musa.....	L.....	Tabriz, Persia.....	Φ K Ψ
Walter Arthur Norris.....	Ch.....	Troy, N. Y.....	———
John Patrick Nugent.....	C.E.....	Troy, N. Y.....	Σ X
Charles Leonard O'Brien.....	C.....	Overton.....	150 P.
John Thomas Owens.....	L.....	Slatington.....	23 S.
Joseph Daniel Person.....	L.....	East Stroudsburg.....	147 P.
Frank Roll Powell.....	Ch.....	Scranton.....	Δ K E
Walter William Propst.....	L.....	Archibold.....	81 N.
William Luther Raup, Jr.....	Ch.....	Milton.....	106 McK.
Austin Hunsicker Reeves.....	C.E.....	Clinton, N. J.....	38 S.
Walter Douglas Rice.....	G.S.....	Easton.....	125 Ferry
Edmund Joseph Roche.....	L.....	Troy, N. Y.....	23 S.
Ernest William Roth.....	Ch.....	Wilkes-Barre.....	74 K.
Victor Raymond Schmidt.....	C.E.....	Nazareth.....	75 K.
Irving Schwed.....	L.....	Somerville, N. J.....	63 B.
Satoshi Shutow.....	Ch.....	Brooklyn, N. Y.....	Sp. Garden
William Gayley Simpson.....	C.....	Elizabeth, N. J.....	Φ K Ψ

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
John Lander Stewart.....	L.....	Phillipsburg, N. J.,	104 So. Main
Charles Edward Straub.....	L.....	Easton.....	43 So. 5th
Paul Morgan Thomas.....	C.....	Lima, Ohio.....	Brd.
Stanley Judson Thomas.....	Ch.....	Scranton.....	83 N.
Robert Legh Warren.....	G.S.....	Shickshinny.....	137 F.
John Dorman West.....	L.....	Phillipsburg, N. J.,	113 Lewis
Charles Oliver Williamson.....	C.....	Easton, So. Delaware River Road	
John Andrew Wilson, Jr.....	C.E.....	Landisburg.....	103 McK.
Maurice Cleveland Wilson.....	L.....	Woodland.....	85 N.
George Rodgers Wood†.....	L.....	St. Clair.....	127 M.
Leon Harold Woolsey.....	C.E.....	New Paltz, N. Y.....	66 B.
JUNIORS.....			81

SOPHOMORE CLASS, 1913.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Thomas Adams.....	C.....	Brooklyn, N. Y.....	132 C.
Claude Mark Albert.....	M.E.....	Pen Argyl.....	417 High
Robert Alexander Altschuler..	L.....	Hackensack, N. J.....	Φ K Ψ
James Burns Amberson.....	L.....	Waynesboro.....	42 S.
Charles Webster Andrews.....	E.E.....	Buffalo, N. Y.....	θ Δ X
Lorenz Kneedler Ayers.....	Ch.....	Easton.....	No. 13th St.
Samuel Seymour Ball.....	E.M.....	Elmira, N. Y.....	Φ K Ψ
Gordon Harold Bannerman....	C.E.....	Titusville, N. J.....	66 B.
Raymond Chase Bergen.....	E.M.....	Trenton, N. J.....	Φ Δ θ
Frederick Lucien Bird.....	C.....	Altoona.....	68 B.
William Miller Bond.....	C.....	Saylorsburg.....	231 Cattell
Francis Shunk Brown, Jr.....	L.....	Philadelphia.....	Z Ψ
Richard Anderson Burk.....	C.E.....	Mt. Hermon, Mass.,	417 New
Adam Brown Caldwell.....	C.....	Williamsport.....	164 E.
Angelo Maria Centanni.....	C.....	Philadelphia.....	174 E.
Ralph Greenfield Chapman....	L.....	Newark, N. J.....	X Φ
Richard Douglas Cheesman....	Ch.....	Easton.....	941 Lehigh
Henry Russell Chidsey†.....	L.....	Easton.....	122 Spring Garden
Isaac Carpenter Clark.....	E.M.....	Takoma Park, D. C.	Φ Δ θ
William Levin Coleman.....	C.....	Easton.....	704 Walnut
Aaron Ross Crane.....	E.M.....	Chatham, N. J.....	—
Louis Creveling.....	Ch.....	Bloomsbury, N. J.....	Home
Montgomery Fletcher Crowe..	C.....	East Stroudsburg....	72 B.
Edward Gilmore Cunningham..	L.....	Sewickley.....	78 K.
Irwin Taite Darlington.....	Ch.....	West Chester.....	Δ K E
George Maxmilian Dery.....	C.....	Catasauqua.....	136 F.
Raymond Herbein DeTurck....	L.....	Oley.....	110 McK.
John Munson Doremus.....	C.E.....	Gladstone, N. J.....	16 S.
Bruce Miller Eaton.....	E.E.....	Landisburg.....	97 McK.
Viers Dalzell Edwards.....	L.....	Braddock.....	74 K.
Charles Garfield Eichlin.....	C.....	Easton.....	1627 Northampton
Herbert Henry Eichlin.....	L.....	Easton.....	36 So. 11th
Frank Eisberg.....	C.E.....	Easton.....	1145 Ferry

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Paul Williams Emanuel.....	G.S....	Catasauqua.....	θ Δ X
Morris Sloan Evans.....	C.E....	Berwick.....	ϕ Δ X
Edwin James Fager, Jr.....	E.E....	Harrisburg.....	ϕ K Ψ
Robert Cumming Ferguson....	E.M....	New York, N. Y....	ϕ Δ θ
Harry Clarence Fernau.....	C.E....	Jeddo.....	114 McK.
James Uhler Fetherolf.....	L.....	Stockertown	Home
Jerome Edward Fishel.....	E.E....	Washington, D. C....	47 S.
Russell Holcombe Fisher.....	L.....	Annandale, N. J.....	Home
William Edward Fitzgerald....	C.E....	Trenton, N. J.....	76 K.
James Aloysius Fleming.....	Ch....	Manchester, N. H. 132	Cattell
James Watson Foresman.....	C.E....	Williamsport.....	Z Ψ
Louis Fernald Foster.....	L.....	Phillipsburg, N. J., 40 Fairview Heights	
Frank Tasker Francis.....	E.M....	Easton.....	307 Burke
Harry Thorton Francis.....	G.S....	Titusville.....	X ϕ
Thomas Armstrong Garretson..	Ch....	Perth Amboy, N. J. 16	S.
Leslie Newton Gay.....	L.....	Shamokin.....	Δ K E
Newell Hardy Grace.....	L.....	Roslyn, L. I., N. Y. 98	McK.
Louis Eugene Griffith.....	E.M....	Rutherford, N. J....	—
William David Gross.....	Ch....	Kingston, N. Y.....	78 K.
Robert Elliot Haas.....	L.....	Allentown.....	ϕ Δ θ
Arthur Browne Hammond, Jr.	L.....	West Chester.....	76 K.
William Oscar Hay, Jr.....	E.E....	Easton.... 15th and Northampton	
Jay Irvin Henshaw.....	L.....	Honesdale.....	84 N.
George Heilman Heydt.....	E.E....	Lehighton.....	117 McK.
Charles Alexander Hindman..	G.S....	Chillicothe, Ohio....	θ Δ X
Herbert Moses Horne	C.....	Vandergrift.....	X ϕ
George Edwin Horr.....	G.S....	Newark, N. J.....	θ Δ X
Vernon Taylor Houghton.....	E.E....	Washington, D. C....	47 S.
Lynott Richard Jones†.....	G.S....	Utica, N. Y.....	Δ K E
Matthew Hale Jones, Jr.....	C.....	Easton... Hotel Huntington	
George Van Sise Keely.....	C.E....	Bayonne, N. J.....	15 S.
Lewis Hoke Kelly.....	L.....	Latrobe.....	ϕ K Ψ
David Francis Kennedy.....	L.....	Youngstown, Ohio....	Z Ψ
Tung Kwei King†.....	C.E....	Shanghai, China. 231	Cattell
Milton Paine Kitchel.....	C.E....	Boonton, N. J.... 117	McK.

NAME	COURSE OF STUDY.	RESIDENCE.	ROOM.
Warren Woodward LaBarr....	E.E....	Winwood.....	84 N.
Paul Fisher Landis.....	L.....	Swarthmore.....	Δ K E
Paul Ellwood Laros.....	E.E....	Phillipsburg, N. J. ———	———
Joseph Walter Lassen.....	C.E....	Philadelphia.....	106 McK.
Andrew McClenathen Lowry....	C.....	Dewart.....	33 S.
William Anselm Lynahan.....	L.....	Corning, N. Y.....	37 S.
John Fackenthal Magee.....	E.M....	Easton.....	Paxinosa Ave.
Alexander Fulton Marshall....	C.E....	Shamokin.....	Δ K E
Charles Given Marshall.....	L.....	Anacostia, D. C. . .	98 McK.
Frederick William Maue.....	E.E....	Hazleton.....	29 S.
Francis Kinsey Metzgar.....	C.E....	Phillipsburg, N. J.,	71 Bennett
Hugh McCauley Miller.....	L.....	Philadelphia.....	Φ K Ψ
Frederick Moorby.....	C.E....	Jamestown, N. Y. . .	163 E.
Harry Waters Moore.....	L.....	High Bridge, N. J. . .	40 S.
Peter John Naher.....	Ch.....	Scranton.....	90 N.
Harry Emil Nelson.....	L.....	Altoona.....	68 B.
Gilbert Nickel.....	C.....	Easton.....	17 So. 9th
Andrew Dickinson Norris†....	G.S....	New York, N. Y. . .	Δ K E
Fred Jefferson Palm.....	M.E....	Warren, O.....	214 McC.
James Lee Pardee.....	G.S....	Hazleton.....	θ Δ X
Alfred Biddle Pearson.....	C.E....	Wyncote.....	Z Ψ
Russell Pellett.....	G.S....	Hamburg, N. J. . .	79 N.
William Leroy Preston.....	C.....	Elysburg.....	———
Charles Knauss Reinke.....	L.....	Philadelphia,	821 Paxinosa Avenue
George Andrew Reiss.....	L.....	Elizabeth, N. J. . .	121 McK.
Elmer Lewis Reynolds.....	C.E....	Madison, N. J. . .	Φ Δ θ
George Jacob Richards.....	E.E....	Easton.....	5 So. 11th
Lloyd Roberts.....	L.....	Slatington.....	22 S.
Edgar Hoffer Royer.....	G.S....	Greensburg.....	Φ Δ θ
George Paxton Russell.....	E.E....	Scranton.....	86 N.
John Elmer Shambach.....	L.....	Williamsport.....	149 P.
Harry Thomas Shannon.....	L.....	Bath, N. Y.....	328 McC.
Alfred Weikel Shoemaker.....	Ch.....	Allentown.....	X Φ
William Michael Silfies.....	C.E....	Bath.....	128 M.
David Bishop Skillman.....	C.....	Philadelphia.....	θ Δ X

NAME	COURSE OF STUDY.	RESIDENCE.	ROOM.
John Leshner Sletor.....	E.E.....	Easton.....	_____
Leon Almon Smith.....	Ch.....	Camptown.....	709 High
Alfred Leroy Spengler.....	Ch.....	Easton.....	123 So. 7th
Lawrence Heck Stone.....	E.M.....	Easton.....	478 Nesquehoning
Chandler Thomas Symons.....	G.S.....	Saginaw, Mich.....	Δ K E
Yunion Allan Sze.....	Ch.....	Shanghai, China.....	232 Cattell
Seth Byron Thomas.....	C.E.....	Easton.....	1506 Ferry
Max Tischler.....	L.....	Wilkes-Barre.....	67 B.
Clifford Sharp Trimmer.....	L.....	Middle Valley, N. J.....	40 S.
Harry Elmer Tyson.....	Ch.....	Weatherly.....	51 S.
Cornelius John Ward.....	Ch.....	Phillipsburg, N. J.,	21 Randall
George Raymond Waterbor....	C.....	Easton.....	445 Line
Roy Pursel Wilson.....	Ch.....	Phillipsburg, N. J.,	68 Bullman
James Robert Winner.....	L.....	Wilmington, Del.....	35 S.
Russell Henry Wohlbach.....	E.E.....	Easton.....	37 So. 13th
David Ober Wolf.....	L.....	Highspire.....	109 McK.
Burton Guy Wood.....	Ch.....	Johnstown, N. Y.....	328 McC.
Thomas Allen Wright, Jr.....	C.....	Wilkes-Barre.....	Δ K E
William Norris Wysham.....	C.....	Baltimore, Md.....	166 E.
John Ephraim Young.....	Ch.....	Easton.....	325 McC.
SOPHOMORES.....			123

FRESHMAN CLASS, 1914.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
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Walter deCoursey Addis.....	E.E....	Philadelphia.....	131 M.
Arthur Sterling Bailey.....	L.....	Lakewood, N. J.....	86 N.
Walker Tomas Banta.....	E.E....	Johnstown, N. Y.....	314 McC.
Walter DeWitt Barker.....	L.....	Matawan, N. J.....	49 S.
Alfred Joseph Barnett.....	L.....	Latrobe.....	138 F.
Elias Harold Bashor.....	L.....	Highspire.....	230 McC.
Geo. Leonidas Evrotas Bellas..	C.E....	Sparta, Greece.....	234 Bushkill
William Raymond Bender.....	C.....	East Bangor.....	1809 Ferry
Cornelius Bergen.....	L.....	Dubuque, Iowa.....	314 McC.
Francis Shiffer Bodine.....	G.S....	Wellsboro.....	5 S.
LaVerne Howard Boland.....	C.E....	Syracuse, N. Y.....	—
Pierson Booth.....	C.E....	Middletown, N. Y.....	152 P.
William Albert Brightman, Jr..	C.E....	Scranton.....	83 N.
Elwood Sandt Brinker.....	L.....	Easton.....	415 High
Alvah Burdette Brown.....	G.S....	Nutley, N. J.....	—
Ralph Fitch Brown.....	C.E....	Honesdale.....	145 P.
Harold Robertson Bruen.....	G.S....	Rockaway, N. J.....	152 P.
Wade Heaton Bunting.....	G.S....	Ashland.....	Φ K Ψ
Edmund Hance Carhart, Jr....	L.....	Belvidere, N. J.....	Z Ψ
Edward Smith Chamberlain....	E.M....	St. Louis, Mo.....	—
Theodore Williams Chandler...Ch....	Scranton.....	417	High
Edward Granville Chesley.....	L.....	Haverhill, Mass.....	X Φ
Charles Chipman.....	G.S....	New York, N. Y.....	Z Ψ
Richard Benjamin Christie....	C.E....	Hackensack, N. J....	

Cattell and Chestnut Sts.

John Wellington Cleaver.....	L.....	Danville.....	11 S.
Earl Vincent Cline.....	C.....	Williamsport.....	155 E.
Stanley Howard Cline.....	E.M....	Phillipsburg, N. J.,	

Home, R. F. D. No. 2

John Riegel Clymer.....	E.M....	Riegelsville.....	θ Δ X
Kenneth Hendrick Colville....	C.E....	Carbondale.....	15 S.
Howard Strong Conklin, Jr....	E.E....	Patchogue, N. Y.....	2 S.
James Ray Conrad.....	C.E....	Reading.....	101 McK.
Harry Abner Cook.....	E.E....	Easton.....	200 McC.
Joseph Watson Craft, Jr.....	G.S....	Ambler.....	140 F.
Jonas Guer Crisman.....	C.E....	Berwick.....	Geo. Simon's

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Walter Sellew Critchlow.....	Ch.....	Titusville.....	$\Phi \Delta \theta$
John Copeland Crozier.....	C.E.....	Milburn, N. J.....	—
Spencer Danby.....	C.E.....	Easton.....	Wayne Ave.
Gilbert Lane Dannehower.....	M.E.....	Norristown.....	138 F.
Allan Palmer Darlington.....	Ch.....	West Chester.....	$\Delta K E$
Harold Arthur Davidson.....	M.E.....	Ramsey, N. J.....	$\Delta K E$
Vergil Alvin Davison.....	C.E.....	Easton.....	Prof. Davison
Samuel James DeWees.....	C.....	Reading.....	130 McC.
Stewart Harold Dewson.....	C.E.....	Easton.....	120 Parker Ave.
David Carlyle Dickson.....	G.S.....	Berwick.....	$Z \Psi$
Lester Martin Drew.....	Ch.....	Hamburg, N. J.....	148 P.
Aaron Patchin Dufton.....	L.....	Clearfield.....	233 McC.
Leland Virgin Dunham.....	C.E.....	Batavia, N. Y.....	110 McK.
Gershom Porter Ellis.....	E.E.....	Avoca.....	45 S.
William Leininger Eshelman..	L.....	Mohnton.....	—
Robert Jacobs Eshleman.....	C.E.....	Berwick.....	$X \Phi$
Charles Clark Evans.....	G.S.....	Berwick.....	$\Phi \Delta \theta$
Stanley Richards Evans.....	C.....	Moosic.....	200 McC.
Frank Marchand Everson.....	G.S.....	Pittsburg.....	$\theta \Delta X$
Solon John Fegely.....	C.....	Mertztown.....	100 McK.
William Hale Francisco.....	C.E.....	Easton.....	638 Walnut
Theodore Freeman.....	G.S.....	Easton.....	501 Lafayette
William Ward Frick.....	M.E.....	Pittsburg.....	80 N.
John Henry Gaffin.....	C.E.....	Wyoming, N. Y.....	172 E.
Frederick Conrad Gamsu.....	C.E.....	Arverne, L. I.....	167 E.
Earl DuTot Gardner.....	C.....	Easton.....	808 Northampton
William Henry Goodwill.....	E.E.....	Shamokin.....	24 S.
William Gould Gould.....	E.M.....	Easton.....	746 Washington
John Summerfield Green, Jr....	G.S.....	Gittings, Md.....	139 F.
James Gregg.....	L.....	Greensburg.....	232 McC.
Benjamin Taylor Hale, Jr.....	Ch.....	Towanda.....	14 S.
Milton Conrad Ham.....	L.....	Millbrook, N. Y. .	136 McC.
Arthur Brooks Hampson.....	G.S.....	Nazareth.....	$Z \Psi$
Henry Stephenson Hampson..	G.S.....	Nazareth.....	$Z \Psi$
Frank Waite Hanford†.....	G.S.....	Seattle, Wash.....	$\theta \Delta X$
Howard Hanks.....	C.E.....	Ridgewood, N. J.....	139 F.
Harvey Taylor Harrison†.....	E.M.....	Pittsburg.....	$X \Phi$

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Ralph Waldo Harrison.....	C.E....	Brooklyn, N. Y.....	Z 7
Chauncey LeBar Hart.....	G.S....	Pennington, N. J.....	Φ Δ Θ
Francis Darlington Hart.....	C.E....	Los Angeles, Cal. Prof. Hart's	
John James Hartigan.....	C.E....	Hadley Falls, Mass.,	
		132 Cattell	
Harold Pauli Heil.....	C.E....	Easton.....	106 Cattell
William Albert Herr.....	L.....	Hazleton.....	175 E.
John Wills Herron.....	L.....	Peoria, Ill.....	Z 7
Horace Kratz Hiestand.....	L.....	Palm.....	170 E.
Charles Allen Hinkle.....	Ch.....	Perth Amboy, N. J.,	
		Mrs. Young's, Porter St.	
William Rodney Holbert.....	L.....	Warrington.....	116 McK.
James Walter Hollenback.....	Ch.....	Reading.....	130 McC.
George Howland Irwin.....	C.E....	Norristown.....	135 F.
Joseph Winter Johnston.....	C.....	Washington, N. J..	Φ Δ Θ
Harry Edward Jones.....	C.E....	Waterbury, Conn.....	168 E.
Paul Adolph Kanengeiser.....	G.S....	Bessemer.....	Z 7
John George Keeler.....	E.E....	LeRaysville.....	129 M.
Robert Volk Keihner.....	L.....	Collingswood, N. J.,	
		Geo. Simon's	
Frank Boone Kelly.....	E.E....	Pitman, N. J.....	62 B.
Gordon Arnold Kelly.....	Ch.....	Easton.....	128 No. 2d
Dyson Armstrong Kennedy....	L.....	Lansdowne.....	136 F.
Joseph Homet Kerrick.....	E.M....	Germantown.....	X Φ
Raymond Anthony Ketchledge C.....		Easton..	1131 Northampton
John Carl Kielman.....	M.E....	Portsmouth, Ohio...	165 E.
Thomas Lester Killough.....	L.....	Elizabeth, N. J.....	50 S.
Frederick Judson King.....	Ch.....	Mt. Pleasant.....	73 K.
John Knight.....	C.E....	Summit, N. J.....	45 S.
Martin Aloysious Knoebel.....	C.E....	Trenton, N. J.....	65 B
Frederick Louis Kolb.....	E.E....	Scranton.....	90 N.
Clarence Albert Kresky.....	L.....	Scranton.....	92 McK.
Harold Custer Kressler.....	M.E....	Bangor.....	133 M.
Harold Samuel Laird.....	C.....	West Chester.....	6 S.
Arthur LaRoe.....	L.....	Perth Amboy, N. J.....	—
Russell Keller Laros.....	E.E....	Easton.....	410 Porter
Frazier Wellwood Lathrope....	C.E....	Carbondale.....	140 F.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Douglas Perkins Lawall.....	L.....	Easton.....	69 No. 2d.
Paul Morley Lee.....	E.E.....	Middletown, N. Y.....	10 S.
Benjamin Lewis.....	C.E.....	New York, N. Y.....	167 E.
Alexander Verner Lloyd.....	G.S.....	Pittsburg.....	θ Δ X
John Roland Lounsberry.....	G.S.....	Branchport, N. Y., 614 Coleman	
LeRoy Gilbert Lugar.....	L.....	Ashbourne.....	131 M.
Robert Chesebrough McCorkle.	G.S.....	New York, N. Y.....	φ K Ψ
Anthony Barrett McCormick.	L.....	Wilkes-Barre.....	———
Thomas Francis McDonald, Jr.	L.....	Stroudsburg.....	44 S.
Edmund Philip McGrath.....	G.S.....	Worcester, Mass.....	233 McC.
David Burrell McWilliams.....	C.E.....	Mifflinburg.....	39 S.
Walter Seeley Mallory, Jr.....	M.E.....	Easton.....	Paxinosa Ave.
John Wesley Magee.....	E.E.....	Easton.....	Meixsell and Pierce
John William Mann.....	L.....	Stockertown.....	Home
Edward Dodd Mead.....	Ch.....	Newark, N. J.....	132 M.
William Cassedy Mecray.....	E.E.....	Cape May City, N. J., 176 E.	
Jacob Frank Meschter.....	C.E.....	East Greenville.....	———
Chester Powers Metzger.....	C.E.....	Glen Gardner, N. J.....	———
Arthur Leon Meyer.....	L.....	Trenton, N. J.....	70 B.
Eugene Kearfott Miller.....	E.M.....	Scottdale.....	θ Δ X
Fred Nathan Miller.....	C.....	Easton.....	414 McC.
Russell Cline Miller.....	C.....	Phillipsburg, N. J., Home, R. F. D. No. 2	
Hobart Condit Mitchell.....	E.E.....	Boonton, N. J.....	102 McK.
William Augustave Moore.....	L.....	Trenton, N. J.....	65 B.
Charles Conyngham Morgan.....	L.....	Wilkes-Barre.....	114 McK.
Terrance James O'Neill.....	C.E.....	Southbury, Conn.....	———
George Torrence Overholt.....	L.....	Scottdale.....	X φ
Floyd Jackson Palmer.....	C.....	Pen Argyl.....	118 McK.
Schuyler Pardee.....	E.M.....	Hazleton.....	θ Δ X
Andrew McClean Parker, Jr.....	C.E.....	Princeton, N. J.....	———
David Paul.....	L.....	Maghera, County Derry, Ireland, Geo. Simon's	
Parvin Elwood Paules.....	L.....	Danville.....	10 S.
Chester Gordon Peck.....	Ch.....	Perth Amboy, N. J.....	49 S.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Leonard Carlton Peckitt.....	Ch....	Catasauqua.....	θ Δ X
Stephen Broadwell Pedrick....	E.E....	Dover, N. J.....	———
Edward Francis Penrose.....	L.....	West Chester.....	6 S.
Courtney Beach Phillips.....	G.S....	Kingston.....	14 S.
William Hunter Powell.....	E.M....	Wyncote.....	Z Ψ
Samuel Clark Price.....	G.S....	Hazleton.....	φ K Ψ
Roger Prosser.....	L.....	Minersville.....	121 McK.
William Clarence Pryce.....	C.....	Ebensburg.....	232 McC.
LeRoy Edward Putnam.....	Ch....	Newark, N. J.....	132 M.
Robert Leon Rankin.....	L.....	Ocean Grove, N. J., Geo. Simon's	
Raymond Lewis Raub.....	L.....	Phillipsburg, N. J....	———
Frederic Anthony Reilly.....	L.....	Pottsville.....	θ Δ X
Frank Joseph Reiser.....	L.....	Hollidaysburg....	701 High
James Thomson Reside.....	C.E....	Salem, N. J.....	136 McC.
Lincoln Leo Rhody.....	L.....	Hollidaysburg....	232 McC.
Roland Grant Richmond.....	C.....	Boonton, N. J.....	93 McK.
Lewis Robbin.....	L.....	Steelton.....	136 McC.
Joseph Seitz Rodenbough....	L.....	Easton.....	410 Clinton
Johnston Wilbur Roling.....	L.....	Easton.....	900 Butler
Frederick Samuel Rowland....	E.E....	Bangor.....	133 M.
Thomas George Ryan.....	L.....	Danville.....	11 S.
James Hiatt Salmon.....	C.E....	Scranton.....	92 McK.
Peter Clark Schoch.....	M.E....	Easton.....	687 Ferry
Marx Hare Schonour.....	C.....	Womelsdorf.....	———
Granville Elwood Schug.....	E.M....	Easton.....	226 McC.
Abraham Jacob Segal.....	L.....	Scranton.....	162 E.
Edwin Rockingham Shackleton	G.S....	Troy, N. Y.....	
Clinton and Cattell			
Howard Leidy Shimer.....	E.E....	Washington, N. J....	φ Δ θ
John Morris Shimer.....	E.E....	Easton.....	812 Ferry
Samuel Mutchler Shipman....	L.....	Paxinosa.....	24 S.
William Cecil Short.....	Ch....	Easton....	1312 Washington
Fred Calvin Shotwell.....	L.....	Phillipsburg, N. J., Home, R. F. D.	
Talbot Quarrier Shrewsbury...E.M....		New York, N. Y....	151 P.
Burton Sturdevant Shupp.....	L.....	Wilkes-Barre.....	28 S.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Moses Hiles Simmons.....	E.E....	Hamburg, N. J.....	148 P.
Russell McCauley Smiley.....	L.....	Altoona.....	73 K.
Howard Arthur Smith.....	M.E....	Easton.....	—
Vincent Robinson Smith.....	L.....	Scottdale.....	θ Δ X
Henry Frederick Snyder.....	C.E....	Jersey City, N. J.....	—
Paul Goodell Snyder.....	C.....	Laceyville.....	—
Ward Mahlon Snyder.....	L.....	Easton.....	244 Bushkill
Archibald Alexander Somerville.	E.M....	Lonaconing, Md.....	77 K.
John Lang Speer.....	G.S....	Vandergrift.....	X φ
Carl Caskey Speidel.....	L.....	Washington, D. C.,	
		Geo. Simon's	
John Elwyn Spiegel.....	L.....	Detroit, Mich.....	X φ
Frederick Hiram Spotts.....	C.....	Williamsport.....	157 E.
Frederick Josiah Spry.....	C.E....	Kingston.....	176 E.
Thomas Findley Steele.....	C.E....	Shamokin.....	42 S.
Paul Lowrey Stein.....	Ch.....	Lewisburg.....	—
Frank Charles Stephens.....	G.S....	Titusville.....	X φ
Benjamin Cornell Stevens.....	L.....	Wyalusing.....	118 McK.
Ellwood Hamilton Stiver.....	Ch.....	Nazareth.....	75 K.
Abram Strausburg.....	L.....	Easton... 741	Northampton
Chauncey Julius Strickland....	Ch.....	Roselle, N. J.....	—
Howard Villeroy Swartz.....	M.E....	Poughkeepsie, N. Y..	70 B.
William Grant Taggart.....	C.E....	Fracksville.....	5 S.
Roger Lockwood Totten.....	L.....	Jersey City, N. J..	119 McK.
Thomas Wayne Trembath....	L.....	Kingston.....	28 S.
Chester Richards Uhler.....	E.E....	Easton.....	—
Hiram Benjamin Van Guilder.	L.....	Stevensville.....	116 McK.
William Wagenhurst.....	M.E....	Norristown.....	230 McC.
Earnest Charles Watson.....	L.....	Washington Court	
		House, Ohio... 100	Cattell
Benjamin John Weismer.....	G.S....	New York, N. Y..	233 McC.
Henry Baron Welty.....	G.S....	Greensburg.....	φ Δ θ
Ffolliott Thornton Whitney...	L.....	St. Paul, Minn.....	80 N.
Kenneth De Witt Widdimer...	L.....	Philadelphia.....	12 S.
Everett Rankin Wilkinson....	E.E....	Rockport, Mass.....	2 S.
Charles McVeigh Willets.....	G.S....	Philadelphia.....	Z ψ
Evan Charles Williams.....	L.....	Portsmouth, Ohio...	72 B.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Edward Bradford Williston....	Ch.....	Phillipsburg, N. J.	———
Oliver Hazard Perry Wolfe....	G.S.....	New York, N. Y.....	———
Francis Walton Wolff.....	C.E.....	Newark, N. J.	Geo. Simon's
Gilbert Allan Woods.....	L.....	Easton.....	Hotel Karlton
Frank Clurihew Wymond.....	C.E.....	Highland Park, Ill.....	Z 4
Andrew Young.....	L.....	Irvington, N. J.....	110 McK.

FRESHMEN..... 213

ABBREVIATIONS FOR BUILDINGS AND COURSES OF STUDY.

Brd.—Brainerd Hall.
 B.—Blair Hall.
 E.—East Hall.
 F.—Fayerweather Hall.
 K.—Knox Hall.
 M.—Martien Hall.
 McC.—McCartney St.
 McK.—McKeen Hall
 N.—Newkirk Hall.

P.—Powell Hall.
 S.—South College.
 $\Delta K E$ —Fraternity House.
 ΣX —Fraternity House.
 $\theta \Delta X$ —Fraternity House.
 $\phi \Delta \theta$ —Fraternity House.
 $\phi K \Psi$ —Fraternity House.
 $Z \Psi$ —Fraternity House.
 $X \phi$ —Fraternity House.

C.—Classical.
 C.E.—Civil Engineering.
 Ch.—Chemical.
 E.E.—Electrical Engineering.

E.M.—Mining Engineering.
 G.S.—General Scientific.
 L.—Latin Scientific.
 M.E.—Mechanical Engineering.

† Reciting on schedule.

— Absent at time of publication of catalogue.

SUMMARY.

Courses.	Seniors.	Juniors.	Sophomores.	Freshmen.	Total.
Graduates.....					13
Classical.....	25	20	18	17	80
Latin Scientific.....	15	23	34	64	136
General Scientific.....	2	4	10	29	45
Civil Engineering.....	14	11	19	42	86
Electrical Engineering....	14	8	14	21	57
Mining Engineering.....	13	5	9	12	39
Mechanical Engineering...	..	..	2	10	12
Chemical.....	7	10	17	18	52
Totals	90	81	123	213	520

CLASSIFICATION BY RESIDENCE (Non-graduates).

California..... 1	Minnesota..... 1	Canada..... 1
Connecticut..... 2	Missouri..... 1	China..... 2
Delaware..... 3	New Hampshire 1	Greece..... 1
Dist. of Columbia 9	New Jersey.... 111	Ireland..... 2
Illinois..... 3	New York..... 46	Panama..... 1
Iowa..... 1	Ohio..... 9	Persia..... 1
Maryland..... 5	Pennsylvania.. 297	
Massachusetts... 5	Texas..... 1	
Michigan..... 2	Washington... 1	

For further information, address "The Registrar, Lafayette College, Easton, Pennsylvania."

VOL. 6, No. 2

FEBRUARY, 1912

BULLETIN

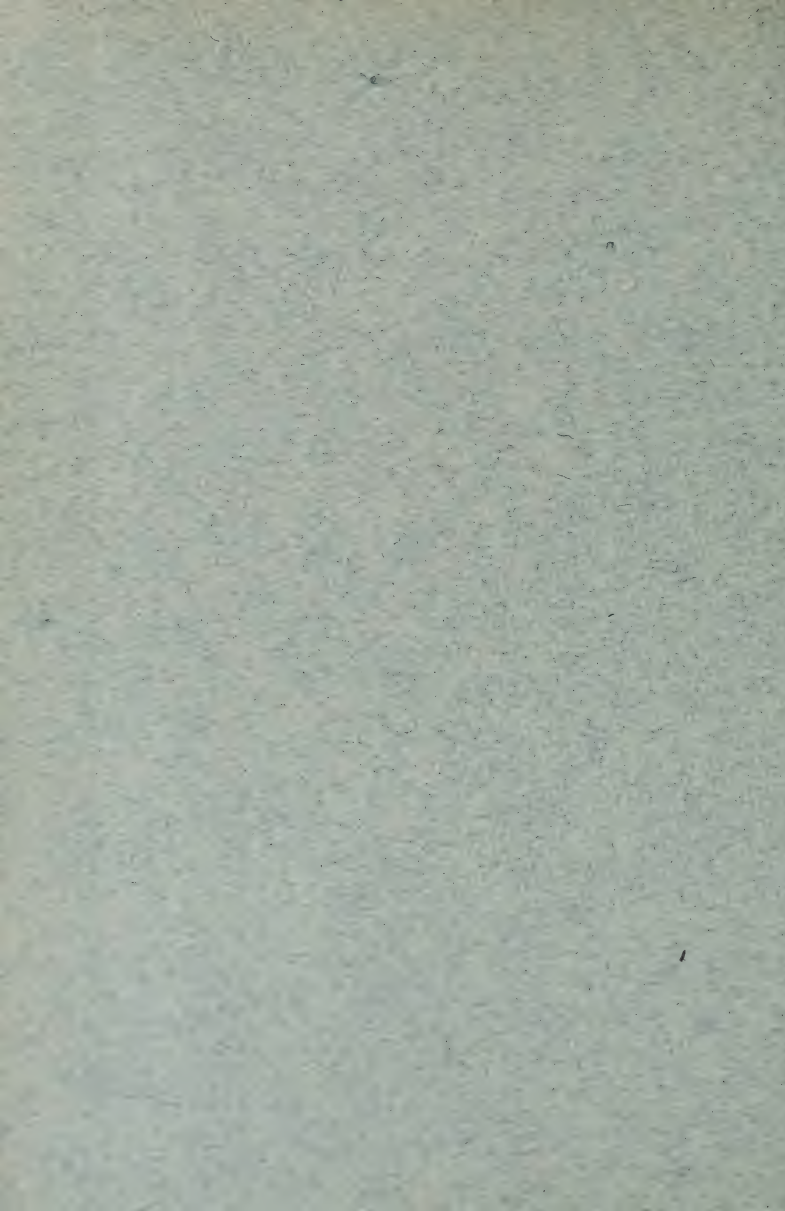
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GENERAL CATALOGUE
1911-1912

PUBLISHED QUARTERLY BY LAFAYETTE COLLEGE

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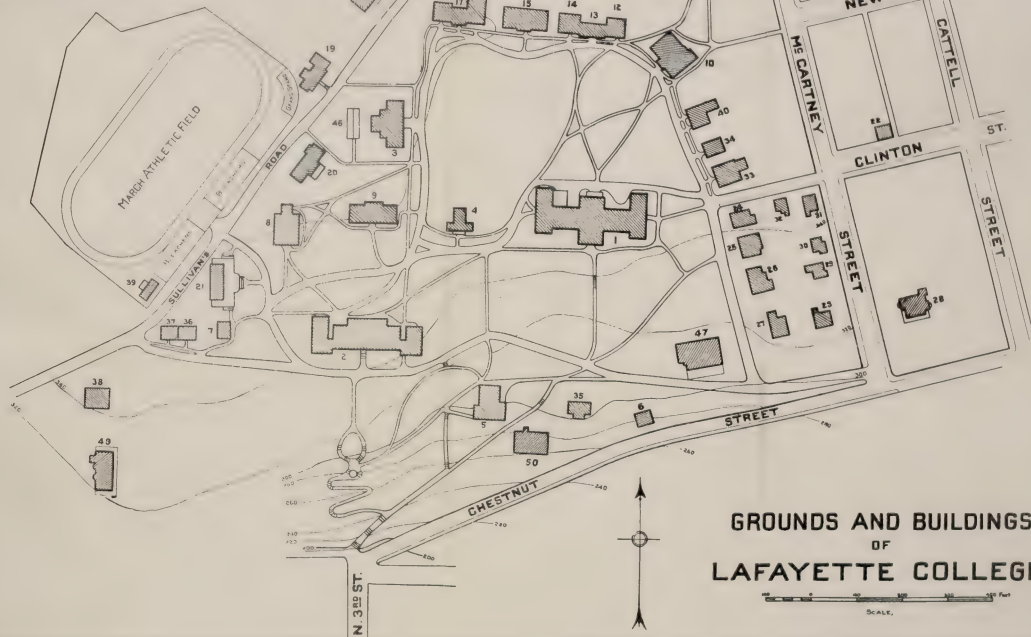


THE
JOHN GREER
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LAFAYETTE COLLEGE, EASTON, PENNSYLVANIA.

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|-------------------------------|-----------------------|---------------------|---------------------------|
| 1 Pardee Hall. | 14 Martien Hall. | 29 Prof. Peek. | 41 to 44 Tennis Courts. |
| 2 South College. | 15 McKee Hall. | 30 Prof. Owen. | 46 Greenhouse. |
| 3 Gayley Hall of | 16 Newkirk Hall. | 31 Prof. Wyser. | 47 Zeta Psi. |
| Chemistry. | 17 Knox Hall. | 32 Prof. Mecklin. | 48 Phi Kappa Psi. |
| 4 Observatory. | 18 Blair Hall. | 33 Prof. Coffin. | 49 Chi Phi. |
| 5 Jenks Biological | 19 Delta Kappa Epsi- | 34 Prof. March, Jr. | 50 Central Heating Plant. |
| Laboratory. | ion | 35 Prof. Hart. | |
| 6 Private Laboratory | 20 Phi Delta Theta | 36 Prof. Raschen. | |
| 7 College Office. | 21 Theta Delta Chi. | 37 Mr. Smith | |
| 8 Gymnasium. | 22 Sigma Chi. | 38 | |
| 9 Van Wickie Li | 23 Prof. Davison. | 39 Field House. | |
| brary. | 24 Prof. Youngman. | 40 Delta Epsilon. | |
| 10 Branard Hall. | 25 Prof. Hardy. | | |
| 11 East Hall. | 26 Prof. Hall. | | |
| 12 Powell Hall. | 27 Prof. Lyle. | | |
| 13 Faverweather Hall. | 28 President Warfield | | |
| 2 and 11 to 18 - Dormitories. | | | |



GROUNDS AND BUILDINGS
 OF
 LAFAYETTE COLLEGE.

B U L L E T I N O F
LAFAYETTE COLLEGE

INCLUDING THE COURSES OF STUDY

IN THE

CLASSICAL *and* SCIENTIFIC
DEPARTMENTS

AND THE

DEPARTMENTS *of* CIVIL, MINING, ELEC-
TRICAL, *and* MECHANICAL ENGINEER-
ING *and of* CHEMISTRY

EIGHTIETH YEAR

1911-1912

EASTON, PENNSYLVANIA

1912

1912

VERITAS LIBERABIT.

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1911.

September 14; Thursday. . . . College year began.
October 18, Wednesday. . . . Founders' Day.
November 30, Thursday. . . . Thanksgiving Day.
December 20, Wednesday. . . . First term ended.

1912.

January 4, Thursday.....Second term began.
January 25, Thursday.....Day of Prayer for Colleges.
March 20, Wednesday.....Second term ends.
April 4, Thursday.....Third term begins.
May 13, Monday.....Junior Oratorical Contest.
May 23-29.....Final Examinations of the Senior Class.
May 30, Thursday.....Memorial Day. Barge Oratorical Con-
test.
June 11-15.....Examination of lower classes.
June 16, Sunday.....Baccalaureate Sermon. Sermon be-
fore the Brainerd Society.
June 17, Monday.....Senior Class Day and Concert.
June 18, Tuesday.....Literary Societies and Class Reunions.
June 19, Wednesday.....Commencement Exercises.
June 20, Thursday.....Examinations for Admission.
September 16, Monday.....Registration for entrance.
September 17-18.....Examinations for admission.
September 19, Thursday...College year begins.
October 16, Wednesday....Founders' Day.
November 28, Thursday....Thanksgiving Day.
December 21, Saturday....First term ends.

1913.

January 3, Friday Second term begins.
January 30, Thursday Day of Prayer for Colleges.
March 19, Wednesday Second term ends.

LAFAYETTE COLLEGE.

Lafayette College is situated at Easton, Pa., upon a site of remarkable beauty, overlooking the confluence of the Delaware and Lehigh rivers. It is thoroughly furnished with the buildings and apparatus to do the work of a progressive college and polytechnic school, and also with the equipment, so important in this age, for a healthful and wholesome student life. Its large and able faculty represent the best traditions of scholarship as well as the recent extensions of scientific knowledge and the newer methods of research. It frankly recognizes its obligation to give its students training, as well as the opportunities for acquiring knowledge, and to make its discipline include moral and spiritual culture. Recent revisions of the requirements for admission and of the courses of study have been made. It will be found that these changes meet the demands of the day for liberty of choice without sacrificing the supreme consideration of thoroughness.

Easton is a railroad center and easily accessible from all directions. It is about seventy-five miles from New York, seventy from Philadelphia, eighty from Scranton and one hundred from Wilkes-Barre and Harrisburg. The Lehigh Valley, Pennsylvania, N. J. Central, Phila. & Reading, D. L. & W., and L. & H. R. Railways afford convenient and rapid facilities for railway travel. It is also an important industrial center, and there are many advantages afforded the students in the Technical courses by its location. Its situation insures the most perfect conditions for the promotion of health.

TRUSTEES.

JOHN WELLES HOLLENBACK, ESQ.....	Wilkes-Barre, Pa.
HON. WILLIAM S. KIRKPATRICK, LL.D.....	Easton, Pa.
REV. ETHELBERT D. WARFIELD, D.D., LL.D....	Easton, Pa.
ISAAC P. HAND, ESQ.....	Wilkes-Barre, Pa.
JAMES GAYLEY, M.E., Sc.D.....	New York City.
ROBERT SNODGRASS, LL.D.....	Harrisburg, Pa.
REV. D. J. WALLER, JR., PH.D., D.D.....	Bloomsburg, Pa.
ISRAEL P. PARDEE, M.E.....	Hazleton, Pa.
CHARLES B. ADAMSON, M.S.....	Philadelphia, Pa.
J. RENWICK HOGG, A.M.....	Philadelphia, Pa.
WILLIAM L. SHEAFER, M.S.....	Pottsville, Pa.
McCLUNEY RADCLIFFE, M.D.....	Philadelphia, Pa.
REV. LEIGHTON W. ECKARD, D.D.....	Philadelphia, Pa.
EDGAR M. GREEN, M.D.....	Easton, Pa.
JOHN MARKLE, M.E.....	Jeddo, Pa.
JOSEPH DE FOREST JUNKIN, ESQ.....	Philadelphia, Pa.
EDWARD J. FOX, ESQ.....	Easton, Pa.
DAVID BENNETT KING, ESQ.....	New York City.
NATHAN GRIER MOORE, ESQ.....	Chicago, Ill.
WILLIAM E. BAKER, C.E.....	New York City.
HORACE P. GLOVER, ESQ.....	Mifflinburg, Pa.
REV. J. BALCOM SHAW, D.D., LL.D.....	Chicago, Ill.
REV. JOHN B. LAIRD, D.D.....	Frankford, Pa.
ANDREW F. DERR, ESQ.....	Wilkes-Barre, Pa.
WILLIAM McMURTRIE, M.E., PHD.....	New York City.
SIMON CAMERON LONG, C.E.....	Pittsburg, Pa.
JOHN E. FOX, ESQ.....	Harrisburg, Pa.
A. C. OVERHOLT, B.S.....	Scottdale, Pa.
WAYNE DUMONT, ESQ.....	Paterson, N. J.

JOHN WELLES HOLLENBACK, <i>President</i>	Wilkes-Barre, Pa.
WILLIAM S. KIRKPATRICK, <i>Vice-President</i>	Easton, Pa.
CHARLES B. GREEN, <i>Secretary and Treasurer</i>	Easton, Pa.

MEETINGS OF THE TRUSTEES.

Thursday, February 8, 1912....	WINTER MEETING.
Thursday, May 2, 1912.....	SPRING MEETING.
Monday, June 17, 1912.....	COMMENCEMENT WEEK.
Wednesday, October 16, 1912....	FOUNDERS' DAY.

FACULTY.

REV. ETHELBERT D. WARFIELD, D.D., LL.D.,
President, Professor of History and Political Science.
 (John I. Blair Foundation.)

*FRANCIS ANDREW MARCH, LL.D., L.H.D., D.C.L., Litt.D.,
*Emeritus Professor of the English Language and Comparative
 Philology.*

REV. ROBERT BARBER YOUNGMAN, A.M., PH.D.,
Emeritus Professor of the Greek Language and Literature.

REV. SELDEN JENNINGS COFFIN, A.M., PH.D. Retired.
 (James H. Coffin Professorship of Astronomy.)

JOSEPH JOHNSTON HARDY, A.M., PH.D.,
Professor of Mathematics and Astronomy.
 (George Hollenback Professorship of Mathematics.)

WILLIAM BAXTER OWEN, A.M., PH.D., Litt.D.
Professor of the Latin Language and Literature.

EDWARD HART, PH.D.,
*Dean of the Pardee Scientific Department, Professor of Analytical
 Chemistry.*
 (William Adamson Professorship of Analytical Chemistry.)

JAMES MADISON PORTER, C.E.,
Professor of Civil Engineering.

FRANCIS A. MARCH, JR., A.M., PH.D.,
Professor of the English Language.
 (Francis A. March Professorship.)

WILLIAM SHAFER HALL, C.E., E.M., M.S.,
Professor of Technical Mathematics.

* Died September 9, 1911.

EDGAR MOORE GREEN, A.M., M.D.,
Consulting Physician in the Department of Physical Training.

ALVIN DAVISON, A.M., PH.D.,
Professor of Biology.
(Jesse Chamberlain Professorship of Botany.)

FREDERICK BURRITT PECK, PH.D.,
Professor of Mineralogy and Geology.

REV. JOHN MOFFAT MECKLIN, A.M., PH.D.,
Professor of Mental and Moral Philosophy.
(James Renwick Hogg Professorship.)

JOHN FREDERICK LOUIS RASCHEN, A.M.,
Professor of Modern Languages.

CLARENCE MCCHEYNE GORDON, PH.D.,
Professor of Physics.

ALLAN ROBERTS, PH.B., M.S.,
Professor of History.

JAMES WADDELL TUPPER, PH.D.,
Professor of English Literature.

JAMES THERON ROOD, PH.D.,
Professor of Electrical Engineering.

WILLIAM THOMAS LYLE, C.E.,
Professor of Municipal Engineering.

EDWIN MOORE RANKIN, A.M., PH.D.,
Professor of Greek.

JOHN EDSON BOYNTON, B.S., in M.E.
Professor of Mechanical Engineering.

HENRY WYSOR, B.S.,
Assistant Professor of Analytical Chemistry and Metallurgy.

*STANLEY EUGENE BRASEFIELD, C.E., M.S.,
Assistant Professor of Mathematics and Graphics.

* Absent on leave.

JAMES BRYANT HOPKINS, A.M.,
Assistant Professor of Romance Languages.

OTHO MCCARROLL GRAVES, B.S. in C.E.,
Assistant Professor of Graphics.

WILLIAM BENJAMIN MARQUARD, E.M.,
Assistant Professor of Mining Engineering.
(George B. Markle Professorship.)

JAMES HENRY DELONG, B.S.,
Instructor in Chemistry.

WILLIAM MACKEY SMITH, PH.B.,
Instructor in Mathematics.

JOHN ROYDEN HESS, PH.B.,
Instructor in Chemistry.

ROBERT WILLIAM THOROUGHGOOD, C.E.,
Instructor in Surveying and Railroad Engineering.

GEORGE ALBERT KOERBER, E.E.,
Instructor in Physics.

REV. ROBERT ROBINSON, A.M.,
Instructor in Hebrew.

WILLIAM HUNTINGTON KIRKPATRICK, A.B.,
Instructor in Municipal Law.

RAYMOND HENRY LACEY, A.M.,
Instructor in Latin.

HAROLD ANSON BRUCE,
Director of Physical Training.

WILLIAM TRUMBOWER FOSTER, PH.B., M.S.,
Instructor in Biology.

D. ARTHUR HATCH, E.M.,
Instructor in Mathematics.

LAFAYETTE COLLEGE.

HOWARD KENT PRESTON, C.E.,
Instructor in Mathematics.

JOHN CAWLEY, B.S.,
Instructor in Mathematics.

ELMER CLAYTON TAYLOR, B.S.,
Instructor in Chemistry.

ELIJAH POTTER FAULCONER, JR., A.B.,
Instructor in Physics.

ALBERT SIDNEY MERRILL, B.S.,
Instructor in Civil Engineering.

JOHN HAWLEY LARNED, A.B.,
Instructor in Latin and Romance Languages.

LEWIS ANDERSON, JR., B.S.,
Instructor in Cement Engineering.

JOHN SHERIDAN LINN, A.B.,
Instructor in English and History.

WILLIAM WALTER PERRY, E.E.,
Instructor in Electrical Engineering.

CLINTON NICHOLS MACKINNON, A.M.,
Instructor in English.

MILTON BERRY DOUB, B.S. in C.E.,
Instructor in Graphics.

ARTHUR EDWIN BYE, B.S.,
Instructor in English.

MERRILL CRISTY HILL, A.B.,
Instructor in Modern Languages.

HAROLD BOSWORTH JELLESON, A.B.,
Instructor in Modern Languages.

SAMUEL WINDSOR ROUNDS.
Instructor in Shopwork.

REGINALD BANCROFT COOKE, A.M.,
Instructor in English.

A. HENRY FRETZ, PH.B., C.E.,
Assistant in Geology.

COLLEGE OFFICERS.

WILLIAM S. HALL, C.E., E.M., M.S.,
Clerk.

WILLIAM T. LYLE, C.E.,
Inspector of Buildings.

REV. JOHN F. STONECIPHER, D.D.,
Librarian.

REV. MAURICE A. FILSON, A.M.,
Assistant in Library.

EDWARD HART, PH.D.,
Curator of Gayley Hall, and Librarian of the Henry W. Oliver Library.

CHARLES B. GREEN, E.M.,
Registrar and Treasurer.

ALBERT MOORE LANE, PH.B.,
Bursar.

DEANS.

College.....Professor Roberts.

SENIOR CLASS.....The President.

JUNIOR CLASS.....Professors Peck and Mecklin.

SOPHOMORE CLASS..Professors Owen and Hall.

FRESHMAN CLASS....Professors Hardy, Raschen, Hopkins and Mr.
Smith.

LAFAYETTE COLLEGE.

ADMISSION.

Every applicant for admission to the College is expected to report at the College offices and register immediately on his arrival. Before registering he must submit to the Registrar a satisfactory certificate of moral character from some person known to the College authorities, and a diploma or certificate of graduation from the school which he last attended, or, if he be not a graduate, a statement that he leaves the school with the approval of its principal and is honorably dismissed to this College, with a statement of the studies which he has pursued and the course which he desires to pursue. His application having been approved he is admitted to the examinations. Examinations are regularly held on the day following the annual commencement day in June, and the days preceding the first day of the Autumn term in September, and also on the first day of the second and third terms.

It is expected that every applicant for admission shall have pursued a four-year course of study in a high school or college preparatory school and shall have successfully completed his course of study representing an equivalent of sixteen hours per week for the four years. The specific requirements for the various courses are not intended to entirely cover all of the secondary school work, especially in the Technical and General Scientific Courses, but only to represent such preparation as is indispensable to enable a student to carry on the studies

which are to be pursued in those courses. It is expected that the certificate of study brought by each student will fully set forth the studies which he has pursued during his secondary school course.

REQUIREMENTS FOR ADMISSION TO THE FRESHMAN CLASS.

CLASSICAL COURSE.

Candidates are examined in the following subjects:

Geography.	English.
History (A), (B) and (C)	Latin.
Mathematics (A).	Greek.

(For details of subjects see pages 15-19.)

LATIN SCIENTIFIC COURSE.

Candidates are examined in the following subjects:

Geography.	English.
History (A), (B) and (C)	Latin.
Mathematics (A).	German (A) or French (A).
Physics or Chemistry.	

(Candidates for the Classical and Latin Scientific Course offering Mathematics (A) and (B) can take advanced courses in Mathematics. After 1913 German (A) and (B) or French (A) and (B) will be required.)

GENERAL SCIENTIFIC COURSE.

Candidates are examined in the following subjects:

Geography.	English.
History (A) and (B).	German (A) and (B) or French
Mathematics (A).	(A) and (B).
Physics or Chemistry.	

and one of the following subjects: Mathematics (B); a Second Modern Language (A) and (B); Latin Grammar, 4 books of Caesar and 2 orations of Cicero or an equivalent).

CIVIL, MINING, ELECTRICAL AND MECHANICAL ENGINEERING AND CHEMICAL COURSES.

Candidates are examined in the following subjects:

Geography (A).	Physics or Chemistry.
History (A) and (B).	English.
Mathematics (A) and (B).	German (A) and (B) or French (A) and (B).

DETAILS OF REQUIREMENTS FOR ADMISSION.

GEOGRAPHY.—It is expected that every applicant shall have had a full course in Political Geography and at least an introductory course in Physical Geography. This requirement need not be met by the secondary school if it has been previously complied with. For the Scientific courses, however, the more advanced study of Physical Geography or Physiography is recommended, and the candidate will receive full credit for such study.

HISTORY.

(A). ANCIENT HISTORY.—A short introduction setting forth the history of the earliest civilizations with particular study of Greek and Roman History down to the fall of Rome.—The following books are recommended: Myers' "Rome, Its Rise and Fall"; Morey's, Leighton's or Allen's Roman History and Morey's or Oman's Greek History.

(B). MEDIAEVAL AND MODERN HISTORY.—Beginning with the results of the great Germanic invasions of Western Europe and tracing the rise of Modern History through the French Revolution epoch. Courses A and B are intended to constitute a course in General History and to give the student a general view of the development of modern civilization and fit him to pursue college courses in history, science, and philosophy with an intelligent understanding of the development of modern life and thought.

(C). AMERICAN HISTORY AND CIVIL GOVERNMENT.—The study of American History may be pursued prior to the secondary school and work done in the grammar grades will be accepted where there is evidence that it has been well done, but it is recommended that it should be a part of the secondary school course. The books of Fiske, McMaster and Johnston are recommended.

(D). ENGLISH HISTORY.—A detailed study of the History of Eng-

and will be accepted as a part of the secondary school preparation but it is not specially required for any of the regular courses of this College and will not be accepted as a substitute for A and B.

MATHEMATICS (A).—*Arithmetic:* Complete, including the Metric System.

Algebra: Fundamental principles. Factoring. Fractions. Simple Equations. Involution. Evolution. Exponents. Quadratic Equations. Simultaneous Quadratic Equations. Equations Solved as Quadratics. Properties of Quadratic Equations.

Geometry: Plane Geometry entire; as in Wentworth, Wells or Loomis.

MATHEMATICS (B).—*Solid Geometry.*

Algebra: Surds and Imaginaries. Simple Indeterminate Equations. Inequalities. Ratio. Proportions and Variations. Progressions.

Plane Trigonometry: Through the solution of right and oblique triangles (Hall and Funk's Trigonometry or an equivalent); candidates should bring their logarithmic tables to the examination.

PHYSICS.—The elementary principles (Millikan and Gale, Hall and Bergen; Carhart and Chute, Mann and Twiss or Hoadley).

CHEMISTRY.—Elements of Inorganic Chemistry.

ENGLISH. *Grammar.*—A general examination will be given without special reference to any particular text-book to test familiarity with paradigms and syntactical analysis, and the correct use of English idioms.

Franklin's Autobiography and Milton's Paradise Lost, Books I and II.

Prose Composition: The writing of a short essay will be required upon a subject drawn from the foregoing text-books. No candidate will be accepted in English whose work is notably deficient in point of spelling, punctuation, idioms, or division into paragraphs.

The English Requirements Recommended by the Association of Colleges and Preparatory Schools will be accepted in place of Franklin's and Milton's works.

Books to be studied: In 1912: Shakespeare's *Macbeth*; Milton's *Comus*, *L'Allegro*, and *Il Penseroso* or Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur*; Burke's *Speech on Conciliation with America*, or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*; Macaulay's *Life of Johnson*, or Carlyle's *Essay on Burns*.

In 1913, 1914, 1915: Shakespeare's *Macbeth*; Milton's *L'Allegro*, *Il Penseroso* and *Comus*; Burke's *Speech on Conciliation with America* or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*; Macaulay's *Life of Johnson* or Carlyle's *Essay on Burns*.

Books to be read: 1912:

Group I (two to be selected). Shakespeare's *As You Like It*, *Henry V*, *Julius Caesar*, *The Merchant of Venice*, *Twelfth Night*.

Group II (one to be selected). Bacon's *Essays*; Bunyan's *The Pilgrim's Progress*, Part I; *The Sir Roger de Coverley Papers* in "The Spectator;" Franklin's *Autobiography*.

Group III (one to be selected). Chaucer's *Prologue*; Spenser's *Faerie Queene* (selections); Pope's *The Rape of the Lock*; Goldsmith's *The Deserted Village*; Palgrave's *Golden Treasury* (First Series), Books II and III, with special attention to Dryden, Collins, Gray, Cowper and Burns.

Group IV (two to be selected). Goldsmith's *The Vicar of Wakefield*; Scott's *Ivanhoe*; Scott's *Quentin Durward*; Hawthorne's *The House of the Seven Gables*; Thackeray's *Henry Esmond*; Mrs. Gaskell's *Cranford*; Dickens's *A Tale of Two Cities*; George Eliot's *Silas Marner*; Blackmore's *Lorna Doone*.

Group V (two to be selected). Irving's *Sketch Book*; Lamb's *Essays of Elia*; De Quincey's *Joan of Arc* and *The English Mail Coach*; Carlyle's *Heroes and Hero Worship*; Emerson's *Essays* (selected); Ruskin's *Sesame and Lilies*.

Group VI (two to be selected). Coleridge's *The Ancient Mariner*; Scott's *The Lady of the Lake*; Byron's *Mazeppa* and *The Prisoner of Chillon*; Palgrave's *Golden Treasury* (First Series), Book IV, with special attention to Wordsworth, Keats and Shelley; Macaulay's *Lays of Ancient Rome*; Poe's *Poems*; Lowell's *The Vision of Sir Launfal*; Arnold's *Sohrab and Rustum*; Longfellow's *The Courtship of Miles Standish*; Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur*; Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Evelyn Hope*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *The Boy and the Angel*, *One Word More*, *Herve Riel*, *Pheidippides*.

Books to be read: 1913, 1914, 1915 (two to be selected from each group).

Group I. *The Old Testament*, comprising at least the chief narrative episodes in *Genesis*, *Exodus*, *Joshua*, *Judges*, *Samuel*, *Kings*, and *Daniel*, together with the books of *Ruth* and *Esther*; the *Odyssey*, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII; the *Iliad*, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; Virgil's *Aeneid*. The *Odyssey*, *Iliad* and *Aeneid* should be read in English translations of recognized literary excellence.

For any unit of this group a unit from any other group may be substituted.

Group II. Shakespeare's *Merchant of Venice*; *Midsummer Night's Dream*; *As You Like It*; *Twelfth Night*; *Henry the Fifth*; *Julius Caesar*.

Group III. Defoe's *Robinson Crusoe*, Part I; Goldsmith's *The Vicar of Wakefield*; Scott's *Ivanhoe* or *Quentin Durward*; Hawthorne's *The House of the*

Seven Gables; Dickens's *David Copperfield* or *A Tale of Two Cities*; Thackeray's *Henry Esmond*; Mrs. Gaskell's *Cranford*; George Eliot's *Silas Marner*; Stevenson's *Treasure Island*.

Group IV. Bunyan's *Pilgrim's Progress*, Part I; *The Sir Roger de Coverley Papers* in "The Spectator;" Franklin's *Autobiography* (condensed); Irving's *Sketch Book*; Macaulay's *Lord Clive* and *Warren Hastings*; Thackeray's *English Humourists*; selections from Lincoln, including at least the two *Inaugurals*, the *Speeches in Independence Hall* and at *Gettysburg*, the *Last Public Address*, and the *Letter to Horace Greeley*, along with a brief memoir or estimate; Parkman's *Oregon Trail*; either Thoreau's *Walden*, or Huxley's *Autobiography* and selections from *Lay Sermons*, including the addresses on *Improving Natural Knowledge*, *A Liberal Education*, and *A Piece of Chalk*; Stevenson's *An Inland Voyage* and *Travels with a Donkey*.

Group V. Palgrave's *Golden Treasury* (First Series), Books II and III, with especial attention to Dryden, Collins, Gray, Cowper, and Burns; Gray's *Elegy in a Country Churchyard* and Goldsmith's *The Deserted Village*; Coleridge's *The Ancient Mariner* and Lowell's *The Vision of Sir Launfal*; Scott's *The Lady of the Lake*; Byron's *Childe Harold*, Canto IV, and *The Prisoner of Chillon*; Palgrave's *Golden Treasury* (First Series), Book IV, with especial attention to Wordsworth, Keats and Shelley; Poe's *The Raven*, Longfellow's *The Courtship of Miles Standish*, and Whittier's *Snow-Bound*; Macaulay's *Lays of Ancient Rome* and Arnold's *Sohrab and Rustum*; Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur*; Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *Herve Riel*, *Pheidippides*, *My Last Duchess*, *Up at a Villa—Down in the City*.

LATIN.—*Grammar*: The Roman method of pronunciation is used.

Caesar: Commentaries, four books, for a portion of which an equivalent in Nepos, Cicero's *De Senectute* or *De Amicitia* will be received.

Cicero: Orationes, seven.

Virgil: Aeneid, six books, *Bucolics*.

Prose Composition: Daniell's or equivalent.

GREEK.—*Grammar*: The applicant should have a thorough acquaintance with the declensions of nouns, pronouns and adjectives and the conjugation of verbs. Especial emphasis is laid upon a familiarity with the forms of words and the essential principles of syntax. Pronunciation of words, with their written accents, should not be disregarded.

Prose Composition: Short sentences, based upon the *Anabasis*, will be set for translation from English into Greek. These are designed to test the applicant's knowledge of the important rules of syntax. (Collar and Daniell, or equivalent.)

Xenophon: Anabasis, four books, or an equivalent in the *Cyropaedia*. The student must be prepared to defend his translations of the passages set for examination.

Homer: Iliad, three books, or *Odyssey*, three books.

GERMAN (A).—An accurate knowledge of the principles of grammar, especially the inflection of articles, adjectives, pronouns, and nouns, the conjugation of the weak and strong verbs; the uses of the modal auxiliaries; the prepositions and their government; the elementary rules of syntax and word order; to be able to read at sight ordinary German prose. It is believed that this requisite facility can be acquired by reading not less than two hundred duodecimo pages of simple German.

GERMAN (B).—This includes a thorough knowledge of accidence, of the elements of word-formation, and of the principal uses of the prepositions and conjunctions. The candidate should be familiar with the essentials of German syntax, and must possess the ability to translate into German easy English prose; to translate at sight passages from standard classical authors. The reading of at least three hundred and fifty pages in addition to that required under German (A) will develop such ability. For examination no specific authors or work are designated. Each candidate is required to bring a statement from his teacher, mentioning text-books used and authors read, including the number of pages translated.

FRENCH (A).—This embraces a thorough knowledge of the rudiments of grammar, including the inflection of the regular and the more common irregular verbs; the inflection of nouns and adjectives for gender and number; the uses of articles and partitive constructions; the forms and positions of personal pronouns; the uses of the other pronouns. Candidates should be able to read at sight ordinary modern prose. It is believed that this ability is acquired by reading two hundred duodecimo pages from the works of at least three different authors.

FRENCH (B).—Candidates should show a thorough knowledge of accidence, and a familiarity with the essentials of French syntax, especially the uses of the tenses, modes, prepositions and conjunctions. They must be able to translate into French a connected passage of simple English, and to translate at sight

standard French authors. This proficiency may be acquired by reading, in addition to that required under French (A), not less than four hundred pages of the works of various standard authors. For examination no special authors or works are designated. Applicants should present a statement from their teachers setting forth the text-books used and the number of pages translated.

PARTIAL OR SPECIAL COURSES.

In addition to the courses above specified, students may be admitted under exceptional circumstances to pursue courses of study of a special character not leading to a degree. Such students are required to undergo such preliminary examination as may be deemed necessary to ascertain their fitness to pursue the proposed course. When admitted they are subject to the same rules and regulations and the same examinations in the studies pursued as are other undergraduates. On completing their course they will receive, on application, certificates of proficiency in such studies as they have satisfactorily completed.

ADVANCED STANDING.

Candidates for advanced standing are examined not only in the preparatory studies, but also specially in the previous studies of the class they wish to enter, or their full equivalents. No certificate from a preparatory school will be accepted as a substitute for College work.

Students from another College bringing certificates of rank and honorable dismissal are permitted to recite on trial with corresponding rank in this College, until there is sufficient test of their qualification for admission to regular standing. They will, however, be examined in the earlier studies of the course they enter which are

not included in the curriculum of the College from which they come, unless there are full equivalents.

No student, whether from another College or not, will be admitted to the Senior class as a candidate for a degree after the beginning of the second term.

CONDITIONS.

Students who fail to pass in a part of the subjects in which they are examined may be admitted upon the condition that they pass a satisfactory examination on such subjects before the end of the term next after that in which they enter. The number of such conditions with which a student is admitted to the College will be determined in each case by a vote of the Faculty.

When a student is admitted upon the condition that he make up one or more deficiencies in a special delinquent class arranged by the College for the benefit of such students he will be required to pay a fee for such course in addition to other College charges.

CERTIFICATES.

Certificates of the Examination Board of the Association of Colleges and Preparatory Schools of the Middle States and Maryland, of the Regents of the University of the State of New York and of certain approved preparatory schools are received in lieu of examination for entrance. Certificates, which will be accepted only from graduates of regularly prescribed preparatory courses, must be signed by the principal and certify only to work done during school hours. They should be filed with the Registrar before the entrance examination in June. Blank certificates will be furnished upon application. Whenever the certificate does not cover

one or more of the requirements of admission or supply a satisfactory equivalent, an examination upon such subject or subjects will be required. Such certificates will not be received after one year from the completion of the period of study for which they are given unless an additional certificate of continued study accompany them.

MATRICULATION.

No student is considered a regular member of the College until after his matriculation, which takes place thirty days after his entrance. During the interval between his admission and matriculation he is, however, in all respects subject to the laws of the College.

DESCRIPTION OF COURSES.

Three courses of study are offered in the Academic department leading to appropriate degrees. These courses have been carefully arranged so as to provide a thorough mental discipline and prepare the student to pursue to advantage the learned professions or to meet the requirements of a business career. The Freshman and Sophomore years are prescribed. The Junior and Senior years are half prescribed and half elective. A very wide choice of studies is provided both by the threefold arrangement of courses and by the numerous electives of the last two years. At the same time continuity and thoroughness are secured by the requirement of a large part of the curriculum.

The Technical courses are prescribed throughout. They are arranged so as to provide in the earlier years a general education of the kind that is indispensable for the successful pursuit of the engineering and chemical professions; and in the later years a thorough professional training.

Every student is expected to arrange a schedule of at least sixteen weekly exercises. These exercises are calculated on the basis of *periods*—the period being the equivalent of one recitation hour or three hours of drawing room, laboratory, or field work. A lecture which does not require previous preparation may be combined with two hours of practical work in a *period*.

The following courses of study are offered:



SOUTH COLLEGE.

CLASSICAL COURSE.

Leading to the degree of A.B.

LATIN SCIENTIFIC COURSE.

Leading to the Degree of Ph.B.

GENERAL SCIENTIFIC COURSE.

Leading to the Degree of B.S.

CIVIL ENGINEERING COURSE.

Leading to the Degree of C.E.

MINING ENGINEERING COURSE.

Leading to the Degree of E.M.

ELECTRICAL ENGINEERING COURSE.

Leading to the Degree of E.E.

MECHANICAL ENGINEERING COURSE.

Leading to the Degree of M.E.

CHEMICAL COURSE.

Leading to the Degree of B.S. in Chemistry.

COURSE NUMBERS.

For description of courses see pages 85-137.

LANGUAGE AND LITERATURE.

1- 50 ENGLISH.

51- 70 ELOCUTION.

71-160 GERMAN AND ROMANCE LANGUAGES.

161-200 CLASSICS.

201-210 HEBREW.

HISTORY, POLITICAL SCIENCE, AND PHILOSOPHY.

221-250 BIBLE.

251-310 PHILOSOPHY.

311-350 HISTORY.

351-400 POLITICAL AND SOCIAL SCIENCE.

SCIENCE AND MATHEMATICS.

401-440 MATHEMATICS.

441-460 GRAPHICS.

- 461-490 PHYSICS.
491-530 GEOLOGY.
531-550 ASTRONOMY.
551-580 BIOLOGY AND HYGIENE.

CIVIL ENGINEERING.

- 601-610 SURVEYING.
611-620 RAILROADS.
621-630 MECHANICS.
631-640 ROADS AND PAVEMENTS.
641-650 MASONRY.
651-660 CEMENT AND CONCRETE.
661-670 HYDRAULICS.
671-680 SEWERAGE.
681-689 WATER SUPPLY.
690-698 ROOFS AND BRIDGES.
699-700 THESES.

MINING ENGINEERING.

- 701-710 MINE SURVEYING.
711-715 MINE EXPLORATION.
716-720 MINE EXPLOITATION.
721-730 MINE CONSTRUCTION.
731-740 ORE DRESSING.
741-750 MINING MACHINERY.
751-760 MINING LAW.
761-770 THESES.

ELECTRICAL ENGINEERING.

- 801-810 GENERAL DIRECT CURRENT ENGINEERING.
811-820 GENERAL ALTERNATING CURRENT ENGINEERING.
821-830 ELECTRICAL LABORATORY.
831-840 ENGINEERING ABSTRACTS.
841-850 ELECTRICAL DESIGN.
851-860 ELECTRIC POWER UTILIZATION.
861-870 ELECTRIC POWER TRANSMISSION.
871-880 ELECTRIC POWER GENERATION.
881-890 ELECTRICAL COMMUNICATION.
891-900 THESES.

CHEMISTRY.

- 901-950 CHEMISTRY.
- 951-960 METALLURGY.
- 961-970 TECHNICAL GERMAN.
- 971-980 THESES.

MECHANICAL ENGINEERING.

- 1001-1020 SHOP WORK.
- 1021-1030 DESIGN.
- 1031-1040 STEAM ENGINEERING.
- 1041-1050 MECHANICAL ENGINEERING LABORATORY.
- 1051-1060 GAS ENGINEERING.
- 1061-1070 HEATING AND VENTILATING.
- 1071-1080 COMMERCIAL ENGINEERING.
- 1081-1090 THESES.

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CLASSICAL COURSE.

The Classical Course, which leads to the Degree of Bachelor of Arts, consists of the historic course in the *Arts*, or *Humanities*, and retains the regular character of that course, which has so long been regarded as the foundation of a liberal education.

This course affords the best preparation for the professions of law, medicine, and theology. The intellectual training and the specific matters of instruction are particularly adapted to the needs of those who follow these professions. It is sometimes doubted whether it is so well adapted to the preparation for the study of medicine as some of the other courses, but the technical vocabulary of medicine is so largely drawn from the Greek, and the history of the medical profession is so closely associated with the development of science in and through the Classical languages as to make it eminently desirable that the cultivated physician should have a classical education. The course includes all the instruction in Physics, Chemistry and Biology which is required for the admission to the best medical schools. It is so well understood that a classical training is highly desirable for the lawyer and the minister that no reference need be made to these professions except to point out that this course offers the broadest and most liberal culture and that there is a marked reaction in the educational world toward its approved methods. The same is true of the education of the teacher and the journalist. Indeed, it is the broadest in its outlook and the most far-reaching in its foundations. The addition of a wide range of

elective studies has made it a desirable preparation for the study of any profession whether literary or scientific.

The instruction embraces a systematic study of the Bible and the Evidences of Christianity throughout the course, of the Ancient and Modern Languages and their literatures, together with Comparative Philology; Pure and Applied Mathematics; Physics, Chemistry, and the Natural Sciences; Rhetoric and Elocution; Logic and Metaphysics; History and Political Science; and Mental and Moral Philosophy.

SYNOPSIS OF STUDIES.

CLASSICAL COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA 2 AND SOLID GEOMETRY 2†.....	4	402 & 406
OR		
SOLID GEOMETRY†.....	4	407
GREEK.....	4	161
LATIN.....	4	181
ENGLISH.....	2	1
HYGIENE.....	1	580
THE BIBLE.....	1	221

Second Term.

ALGEBRA†.....	4	403
OR		
ALGEBRA†.....	4	404
GREEK.....	4	162
LATIN.....	4	182
ENGLISH.....	2	2

* See pages 85-137.

† Entered with Mathematics B, Division A.

‡ Entered with Mathematics A, Division B.

	Periods per week.	Course number.*
ELOCUTION.....	1	51
THE BIBLE.....	1	222

Third Term.

TRIGONOMETRY†.....	4	412
OR		
ALGEBRA‡.....	4	405
GREEK.....	4	163
LATIN.....	4	183
ENGLISH.....	2	3
ELOCUTION.....	1	52
THE BIBLE.....	1	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY†.....	4	418
OR		
TRIGONOMETRY‡.....	4	413
GREEK.....	4	164
LATIN.....	4	184
ENGLISH.....	2	14
FRENCH.....	2	126
ELOCUTION.....	1	53
THE BIBLE.....	1	227
THEMES.		

Second Term.

PLANE AND SOLID ANALYTICAL GEOMETRY†.....	4	419
OR		
PLANE ANALYTICAL GEOMETRY‡.....	4	420
GREEK.....	4	165
LATIN.....	4	185
ENGLISH.....	2	10
FRENCH.....	2	127

* See pages 85-137.

† Entered with Mathematics B, Division A.

‡ Entered with Mathematics A, Division B.

	Periods per week.	Course number.*
ELOCUTION.....	1	54
THE BIBLE.....	1	228
THEMES.		

Third Term.

PHYSICS.....	4	463
GREEK.....	4	166
LATIN.....	2	186
FRENCH.....	2	128
GERMAN.....	3	80
CHEMISTRY.....	2	901
ELOCUTION.....	1	55
THE BIBLE.....	1	229
THEMES.		

JUNIOR YEAR.

First Term.

PHYSICS.....	4	461
GERMAN.....	3	81
ELOCUTION.....	1	56
THE BIBLE.....	1	236
THEMES.		

ELECTIVES.

MATHEMATICS.....	4	429
PHILOSOPHY.....	2	251
GREEK.....	4	167
GEOLOGY.....	2	491
ENGLISH A.....	4	19
CHEMISTRY.....	2	902
BIOLOGY.....	2	551
FRENCH.....	2	129
HISTORY.....	2	321
LATIN.....	2	187
BIOLOGY.....	2	571
ENGLISH B.....	4	41

Second Term.

PHYSICS.....	4	462
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* See pages 85-137.

	Periods per week.	Course number.*
PHILOSOPHY.....	3	252
ELOCUTION.....	1	57
THE BIBLE..	1	237
THEMES.		

ELECTIVES.

ENGLISH A.....	4	20
MATHEMATICS.....	4	430
GEOLOGY.....	2	492
GREEK.....	4	168
GERMAN.....	2	82
HISTORY.....	2	322
CHEMISTRY.....	2	903
HISTORY.....	2	331
FRENCH.....	2	130
LATIN.....	2	188
BIOLOGY.....	4	552
ENGLISH B.....	4	42
SPANISH.....	2	141
ITALIAN.....	2	151

Third Term.

HISTORY.....	4	351
PHILOSOPHY.....	2	254
ELOCUTION.....	1	58
THE BIBLE.....	1	238
THEMES.		

ELECTIVES.

ENGLISH A.....	4	21
MATHEMATICS.....	4	431
GEOLOGY.....	2	493
GREEK.....	4	169
GERMAN.....	2	83
PHYSICS.....	2	463-6-9
CHEMISTRY.....	2	904
BIOLOGY.....	4	553
FRENCH.....	2	131

* See pages 85-137.

	Periods per week.	Course number.*
LATIN.....	2	189
ENGLISH B.....	4	43
SPANISH.....	2	142
ITALIAN.....	2	152

SENIOR YEAR.

First Term.

ASTRONOMY.....	4	536
PHILOSOPHY.....	3	281
ELOCUTION.....	1	59
BIBLE.....	1	242
THEMES.		

ELECTIVES.

ENGLISH A.....	4	22
HISTORY.....	2	361
PHILOSOPHY.....	2	251, 253, 291
PHYSICS.....	2	464, 467
CHEMISTRY.....	2	905
INTERNATIONAL LAW.....	2	376
MATHEMATICS.....	2	432
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BIOLOGY.....	4	554
ENGLISH B.....	4	44
GREEK.....	4	170
FRENCH.....	2	132
GEOLOGY.....	2	494
LATIN.....	2	190
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Second Term.

PHILOSOPHY.....	2	302
POLITICAL ECONOMY.....	2	381
ELOCUTION.....	1	60
BIBLE.....	1	243
THEMES.		

ELECTIVES.

HISTORY.....	2	352
MATHEMATICS.....	2	433

* See pages 85-137.

	Periods per week.	Course number.*
GERMAN.....	2	91 or 94
GEOLOGY.....	2	495
ENGLISH A.....	4	23
BIOLOGY.....	4	555
GREEK.....	4	171
FRENCH.....	2	133 or 135
LATIN.....	2	191
HEBREW.....	2	201
PHILOSOPHY.....	2	292, 301
ENGLISH B.....	4	45
BLACKSTONE.....	2	371
BUSINESS LAW.....	2	372
PHYSICS.....	2	465, 470
CHEMISTRY.....	2	906
ASTRONOMY.....	2	541
HISTORY.....	2	362
ANGLO-SAXON (optional).....	1	13
SPANISH.....	2	141
ITALIAN.....	2	151

Third Term.

POLITICAL ECONOMY.....	2	382
PHILOLOGY.....	3	30
ELOCUTION.....	1	61
BIBLE.....	1	244
THEMES.....		

ELECTIVES.

HISTORY.....	2	353
MATHEMATICS.....	2	434
GERMAN.....	2	92 or 95
GEOLOGY.....	2	496
ENGLISH A.....	4	24
BIOLOGY.....	4	556
GREEK.....	4	172
FRENCH.....	2	134 or 136
LATIN.....	2	192

* See pages 85-137.

	Period per week.	Course number.*
HEBREW.....	2	202
ENGLISH B.....	4	46
BLACKSTONE.....	2	372
PHYSICS.....	2	468, 469
CHEMISTRY.....	2	907
ASTRONOMY.....	2	542
HISTORY.....	2	363
PHILOSOPHY.....	2	293, 303
ANGLO-SAXON (optional).....	1	14
SPANISH.....	2	142
ITALIAN.....	2	152

* See pages 85-137.

PARDEE SCIENTIFIC DEPARTMENT.

This Department was organized in 1866, in accordance with the conditions of a gift from Ario Pardee, Esq., of Hazleton, Pa. The original organization has been, from time to time, greatly enlarged and extended largely through the continued munificence of the founder. There are at present two general courses of study, Latin Scientific and the General Scientific, and four technical courses.

LATIN SCIENTIFIC COURSE.

This course, which leads to the Degree of Bachelor of Philosophy, was designed to meet the wishes of those who desire to pursue a course of liberal study without Greek. It is the same as the Classical Course except that the time devoted to the study of Greek in that course is given to the study of modern languages; great importance is paid to the study of the English language under the special direction of Professor Francis A. March, Jr.

By a new arrangement, those students in the Latin Scientific Course who desire to do so may begin Greek in the Freshman year, substituting it in Freshman and Sophomore years for modern languages. Those who pursue the study of Greek under this arrangement for four years may qualify for the Bachelor of Arts degree.

SYNOPSIS OF STUDIES.

LATIN SCIENTIFIC COURSE.

The course of study is the same as the Classical Course except as follows:

FRESHMAN YEAR.

German 84-85-86 is substituted for Greek, four periods a week being given to this subject during the three terms.

SOPHOMORE YEAR.

The Bible is read in Latin 230-31-32 instead of Greek. English 16-17-18 and German 87-88-89 are substituted for Greek.

JUNIOR YEAR.

The Bible is read in Latin 230-40-41 instead of Greek. English History 321 is substituted for German 81. German 91-92 are substituted for 81-3.

(For schedule of studies of the Classical Course see pages 36-42.)

GENERAL SCIENTIFIC COURSE.

This course was originally arranged to meet the demand for a course substituting the modern languages for Latin and Greek, and offering greater opportunities for the study of the sciences than was formerly given in the Classical Course. The extension of the elective system has greatly modified the character of this course. It now is rather designed to meet the requirements of students who in their preparatory course have failed to take advantage of opportunities for the study of the classics, and who are seeking a general preparation for business careers or for other callings which do not seem to require an acquaintance with the classical languages and literatures. In order to meet the very different inclinations of students and to make a close articulation with a large number of preparatory schools, a greater latitude is allowed in the preparation for this course than for the other courses, and more consideration is given to individual choice in its earlier years.

Those students who offer advanced mathematics for admission are expected to pursue advanced courses in

mathematics and drawing with the students of the engineering courses. Those who enter with the same requirement in mathematics as the students of the Latin Scientific Course will pursue the mathematics of that course. Those who offer advanced mathematics will also be expected to pursue the course in chemistry of the engineering courses and to take options connected with the mathematical group throughout the Freshman year. Those who do not offer advanced mathematics will be permitted to choose at the outset of their course between a more distinctly mathematical and scientific course and one offering more extensive courses in modern languages and history. The choice once made will be binding throughout the first two years.

The degree awarded at the completion of this course is Bachelor of Science.

Frequent request is made by students entering this course to be allowed so to modify its requirements as to anticipate some of the courses, particularly those in physics and biology, and thus provide a two years' course on a special schedule. The ground for this request is generally the purpose to prepare for admission to a school of medicine. The arrangement of this course, and more particularly of the Latin Scientific Course, with the opportunities for the election of extensive courses in Biology, Chemistry, Physics, and German has been made after consultation with leading teachers of medicine, and with the view of preparing students for the best medical schools. The order in which the sciences are studied has been carefully considered. The degree of mental development has determined the period in which each study is taken up. The importance of the mental discipline

LAFAYETTE COLLEGE.

and the equipment of the student for his future work has been met in the requirements in Mathematics, English, and Psychology. In all of these respects this course, like all the courses offered by the College, aims rather at thoroughness than quickness of preparation. It is intended to impress upon the student that success in any profession or calling can be attained only by thoroughgoing and liberal training.

SYNOPSIS OF STUDIES.

GENERAL SCIENTIFIC COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
1. ALGEBRA.....	4	401
ENGLISH.....	2	1
CHEMISTRY.....	4	911
DRAWING AND LETTERING.....	2	441a, 442a
GERMAN.....	4	75
OR		
FRENCH.....	4	115
HYGIENE.....	1	580
THE BIBLE.....	1	221
2. ALGEBRA AND SOLID GEOMETRY.....	4	402 & 406
ENGLISH.....	2	1
GERMAN.....	4	75
FRENCH.....	4	115
HISTORY.....	2	334
HYGIENE.....	1	580
THE BIBLE.....	1	221

Second Term.

1. TRIGONOMETRY.....	5	411
ENGLISH.....	2	2
CHEMISTRY.....	2	926

* See pages 85-137.

	Periods per week.	Course number.*
GERMAN.....	4	71
OR		
FRENCH.....	4	111
DRAWING AND LETTERING.....	2	441 <i>b</i> , 442 <i>b</i>
THE BIBLE.....	1	222
2. ALGEBRA.....	4	403
ENGLISH.....	2	2
GERMAN.....	4	71
FRENCH.....	4	111
HISTORY.....	2	334
THE BIBLE.....	1	222

Third Term.

1. ANALYTICAL GEOMETRY AND MENSURATION. . .	5	416 & 421
ENGLISH.....	2	3
CHEMISTRY.....	2	927
GERMAN.....	4	72
OR		
FRENCH.....	4	112
DRAWING AND LETTERING.....	2	443
THE BIBLE.....	1	223
2. TRIGONOMETRY.....	4	412
ENGLISH.....	2	3
GERMAN.....	4	72
FRENCH.....	4	112
HISTORY.....	2	334
THE BIBLE.....	1	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY 2 AND DIFFERENTIAL CAL- CULUS 3†.....	5	417 & 426
OR		
ANALYTICAL GEOMETRY†.....	4	418
ENGLISH.....	2	14
ENGLISH.....	2	15

* See pages 85-137.

† Entered with Mathematics B.

‡ " " " " A.

	Periods per week.	Course number.*
ENGLISH	2	16
CHEMISTRY.—Analytical Chemistry.....	2	928
HISTORY.....	2	312
THE BIBLE.....	1	224

Second Term.

CALCULUS†.....	5	427
OR		
ANALYTICAL GEOMETRY‡.....	4	419
ENGLISH.....	2	17
ENGLISH.....	2	15
CHEMISTRY.....	2	929
HISTORY.....	2	313
ANGLO-SAXON.....	2	10
THE BIBLE.....	1	225

Third Term.

PHYSICS.....	4	461
ENGLISH.....	4	18
ENGLISH.....	2	15
BIOLOGY.....	4	561
CHEMISTRY.....	2	930
HISTORY.....	2	313
THE BIBLE.....	1	226

JUNIOR YEAR.

First Term.

PHYSICS.....	4	462
HISTORY.....	2	321
ELOCUTION.....	1	56
THE BIBLE.....	1	233

ELECTIVES.

GEOLOGY.....	2	491
ENGLISH A.....	4	19
ENGLISH B.....	2	41
CHEMISTRY.....	2	931

* See pages 85-137.

† Entered with Mathematics B.

‡ Entered with Mathematics A.

	Periods per week.	Course number.*
BIOLOGY.....	2	551
BIOLOGY.....	2	571
FRENCH.....	2	129
GERMAN.....	2	90-93-96

After the First Term, Junior year, the schedule of study for the General Scientific Course is the same as for the Classical Course, except that during the rest of the Junior year the Bible is read in German 234-35 instead of Greek; and German 91-2, 94-5 or 97-8 is substituted for 82-3. (For schedule of study of the Classical Course see pages 36-42.)

* See pages 85-137.

THE CIVIL ENGINEERING COURSE.

The course in Civil Engineering has been designed to develop the mental faculties of the student in those studies which form the foundation of all branches of Technology with additional training in the subjects classed as Civil Engineering. The course also includes such general subjects, essential to a liberal education, as are shown in the synopsis on pages 54-58.

The graduate is prepared for immediate usefulness in the field and office, and, after a moderate amount of professional experience, to fill positions of trust and importance, not only in his chosen profession, but in allied work in mining, mechanical, electrical and architectural engineering.

CIVIL ENGINEERING LABORATORIES AND EQUIPMENT.

The Department has a large equipment of instruments necessary for various branches of engineering field practice, including tapes, compasses, transits, levels, plane tables, barometers, standard base line tapes and pulling apparatus, sextants, solar attachments, chronometers, floats and current meters. A twelve-inch portable alt-azimuth instrument, reading to single seconds by micrometer microscopes, and provided with level for double zenith distances, is used for instruction in Geodesy and Practical Field Astronomy. A precision level of the latest design is employed in instruction in precise leveling. The astronomical observatory contains an equatorial



MARTIEN, FAYERWEATHER AND POWELL HALLS.

telescope, transit, clock, chronograph, meteorological instruments, etc.

For use in the lecture room there are numerous models of the various types of bridge and roof trusses; several complete sets of full-weight standard rolled sections; numerous full-weight sections of riveted joints, representing bridge and boiler work, hand and power riveting; wall charts; working drawings; photographs; slide rules; and lantern, with reflectoscope. The hydraulic lecture room is directly connected with the laboratory, and the equipment of the latter is used for demonstration purposes before the class.

The Department also has a full-weight pin-connected highway bridge of fifty-feet span and fourteen-feet roadway weighing twelve tons, together with all false work and tools necessary to erect the same.

The GENERAL TESTING LABORATORY contains one transverse machine of 400,000 pounds capacity for specimens up to twenty-five feet in length and four feet in width, one 200,000-pound, three 100,000-pound screw testing machines and one 60,000-pound hydraulic testing machine arranged for tension, compression and transverse testing; a 4,000-pound wire tester and a small machine for testing cord, twine, etc.; a 4,000-pound transverse machine for specimens up to sixteen feet, and a smaller transverse machine for specimens up to five feet, arranged with micrometers for measuring deflections, and extension meters for measuring fiber deformations. The laboratory also contains a torsion machine of 125,000 inch-pound capacity for specimens up to twenty feet in length and a 10,000 inch-pound torsion machine of the pendulum type for short specimens;

a number of elongation meters of different types, compressometers and smaller micrometers, hand tools, etc., and apparatus for calibrating machines. There are also a number of special apparatus for shearing, punching, bending, etc., tests.

The CEMENT LABORATORY contains three 1,000- and two 2,000-pound machines for testing cement by tensile, compressive, and transverse stress, a machine for moulding briquettes under pressure, a power-driven Boehme Hammer, a ball mill, an automatic sieving apparatus, apparatus for accelerated tests, etc. It is further equipped with large immersion tanks with running water, cement bins, briquette racks, and the necessary moulds, sieves, scales, moist closets, specific gravity apparatus, etc. It also contains a number of slate-top mixing tables, each provided with a moist closet, scales and the necessary hand tools.

The CONCRETE LABORATORY contains a large mixing floor, an immersion tank and the necessary moulds for beams up to fifteen feet in length, moulds for compression specimens, a beam crane and trucks of two tons capacity for the convenient handling of specimens, scales, sieves, measures and storage bins for stone, sand and cement.

The HYDRAULIC LABORATORY contains a vertical pressure tank eighteen feet in height and five feet in diameter, arranged for making experiments on the flow of water through orifices and nozzles under heads up to three hundred feet, and provided with a device by which the orifice plates can be removed while the tank is under pressure; other smaller tanks for use under low heads; a standpipe sixty feet high; two tanks, thirty feet long for weir experiments and measurements of

quantity; a turbine; impulse wheels; a centrifugal pump run by electric motor and provided with electric measuring instruments and transmission dynamometer; rotary, disc and reciprocating water meters; a Venturimeter; a weighing tank; absolute and differential pressure gauges; and other appliances for the measuring of water used in experiments and for the testing of meters, motors, nozzles and fire hydrants; as well as arrangements for lecture-room illustrations. There is also connected with the laboratory a boiler plant and a one-million gallon Worthington duplex pump upon which tests are made.

THE ROAD MATERIAL LABORATORIES.--Section 1 contains a rattler for testing paving brick with the necessary oven, scales, immersion tanks, etc. Transverse tests of paving brick are made in the General Testing Laboratory.

Section 2 contains a Deval abrasion machine for testing road metal together with the necessary scales, sieves, etc.

Section 3 will contain apparatus for making tests on petroleums, malthas, tars and asphalts in accordance with the methods employed by the office of Public Roads at Washington.

The **SHOP**, which is in charge of a skilled mechanic, contains two lathes, a drill press, a planer, a milling machine, a grinder and other necessary appliances for preparation of test specimens, models and apparatus and for repair work.

The **LIBRARY** contains the best and latest books and periodicals upon engineering subjects, and the students are encouraged to make free use of the same.

SYNOPSIS OF STUDIES.

CIVIL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Period per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911
GERMAN†.....	4	75
OR		
FRENCH‡.....	4	115
ENGLISH.....	2	1
DRAWING AND LETTERING.....	2	441a-442a
THE BIBLE.....	1	221
HYGIENE AND PHYSICAL CULTURE.....	1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	926
GERMAN†.....	4	71
OR		
FRENCH‡.....	4	111
ENGLISH.....	2	2
DRAWING AND LETTERING.....	2	441b-442b
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY.....	4	416
MENSURATION.....	1	421
CHEMISTRY.....	2	927
GERMAN†.....	4	72
OR		
FRENCH‡.....	4	112
ENGLISH.....	2	3
DRAWING AND PROJECTIONS.....	2	441c
SURVEYING.....	2	601

* See pages 85-137.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
THE BIBLE.....	1	223
SUMMER SCHOOL IN SURVEYING (in vacation) THREE WEEKS.....		602

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
PHYSICS.....	4	461
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451a
SURVEYING.....	2	603
SHOP WORK.....	2	1001
THE BIBLE.....	1	224
THEME.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
PHYSICS.....	4	462
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451b
RAILROADS.....	2	611
SHOP WORK.....	2	1002-3-4
THE BIBLE.....	1	225
THEME.		

Third Term.

ENGLISH.....	2	4
PHYSICS.....	4	463
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451c
MACHINE DRAWING.....	1 $\frac{1}{3}$	452
APPLIED MECHANICS.....	4	621
RAILROADS.....	2	612
SHOP WORK.....	2	1005
THE BIBLE.....	1	226
SUMMER SCHOOL IN SURVEYING (in vacation) THREE WEEKS.....		613
THEME.		

* See pages 85-137.

JUNIOR YEAR.

First Term.

	Periods per week.	Course number.*
METALLURGY.....	2	951
CRYSTALLOGRAPHY.....	2	511
APPLIED MECHANICS.....	4	622
RAILROADS.....	3	614
MECHANICS OF MATERIALS.....	4	623
GENERAL TESTING LABORATORY.....	2	625
CEMENT.....	2	651
CEMENT LABORATORY.....	2	654
ELEMENTS OF ELECTRICAL ENGINEERING.....	4	804
THE BIBLE.....	1	233
THEME.		

Second Term.

STEAM ENGINEERING.....	4	1031
PETROGRAPHY.....	2	512
SPANISH (optional).....	2	141
ITALIAN (optional).....	2	151
MECHANICS OF MATERIALS.....	4	624
GENERAL TESTING LABORATORY.....	2	626
ELECTRICAL LABORATORY.....	2	827
CONCRETE, PLAIN.....	2	652
CONCRETE (PLAIN) LABORATORY.....	2	655
RAILROADS.....	2	615
ROADS AND PAVEMENTS.....	2	631
ROAD MATERIAL LABORATORY.....	1	632
MECHANICAL ENGINEERING LABORATORY.....	1	1041
THE BIBLE.....	1	234
THEME.....		

Third Term.

MINERALOGY (systematic).....	3	513
SANITARY BIOLOGY.....	2	561
SPANISH (optional).....	2	142
ITALIAN (optional).....	2	152
CONCRETE, REINFORCED.....	2	653

* See pages 85-137.

	Periods per week.	Course number.*
CONCRETE (REINFORCED) LABORATORY.....	2	656
HIGHER SURVEYING.....	2	604
MASONRY.....	2	641
HYDRAULICS.....	3	661
HYDRAULIC LABORATORY.....	1	663
FRAMED STRUCTURES.....	2	690
ELECTRICAL LABORATORY.....	2	828
BIBLE.....	1	235
THEME.		

SENIOR YEAR.

First Term.

GENERAL GEOLOGY.....	2	516
DESCRIPTIVE ASTRONOMY.....	2	531
ROOFS AND BRIDGES.....	2	691
ROOF DESIGN.....	1	694
GRAPHIC STATICS.....	1	698
HYDRAULICS.....	3	662
HYDRAULIC FIELD WORK.....	—	664
MASONRY DESIGN.....	2	642
SEWERAGE.....	2	671
BIBLE.....	1	242
THEME.		

Second Term.

POLITICAL ECONOMY.....	2	381
GENERAL GEOLOGY.....	2	517
ROOFS AND BRIDGES.....	6	692
BRIDGE DESIGN.....	2	695
SEWERAGE DESIGN.....	2	672
WATER SUPPLY.....	3	681
PARK ENGINEERING.....	2	683
BIBLE.....	1	243
THEME.		

Third Term.

ROOFS AND BRIDGES.....	5	693
BRIDGE DESIGN.....	5	696

* See pages 85-137.

	Periods per week.	Course number.*
BRIDGE ERECTION.....	(2 days)	697
WATER SUPPLY DESIGN.....	2	682
THESIS.....	2	699
BIBLE ...	1	244

* See pages 85-137.

THE MINING ENGINEERING COURSE.

The course leading to the degree of Engineer of Mines (E.M.) is intended to give a general education and to prepare men for positions of responsibility in mining, metallurgy and general engineering. The policy of the Mining Department is to give thorough training in the underlying principles of mathematics, physics, chemistry, mineralogy, geology, metallurgy, surveying, mining engineering, and some practical knowledge in mechanical, civil and electrical engineering. With this fundamental training the mining graduates can successfully carry on specialized work and be rapidly advanced to positions of responsibility.

The training in geology consists of the study of mineralogy, crystallography, petrography, general and economic geology, and the geology of ore deposits.

The course in chemistry consists of lectures, recitations and laboratory work in inorganic chemistry, qualitative and quantitative analysis, stoichiometry, metallurgical analysis, blowpiping and assaying.

The work in the chemical, physical, mineralogical and geological laboratories and the drafting rooms is of a high standard. Although much time is given to the practical training in the laboratories, yet the work in such laboratories is always subordinated to the fundamental and all important class room work.

The study of Mining proper consists of courses extending throughout the Junior and Senior years and includes: mine surveying and problems, prospecting, deep boring, blasting, quarrying, shaft-sinking, drifting,

tunneling, methods of mining and timbering, haulage, winding, ventilation, drainage, mining laws, mine and mill construction, ore dressing, metallurgy, mine machinery and mine administration.

Lafayette College is situated within easy reach of the anthracite coal fields, and magnetic iron mines of Pennsylvania and New Jersey, the zinc and copper mines of New Jersey and extensive quarries of cement rock, slate, serpentine, limestone and sandstone; the skilfully arranged Bethlehem Steel Works, and also rolling mills, iron foundries, the Ingersoll-Rand Co., which is one of the largest manufacturers of mine machinery in the world, are located near Easton, and thus the mining students have opportunities of inspecting and studying the practical mining and metallurgical methods.

EQUIPMENT.

The college library contains the important periodicals on mining, metallurgical and engineering, and the transactions of the various engineering societies. A special mining library containing all mining books of value has been created for the convenience of the mining students.

The class room work in mining is illustrated by a large number of lantern slides, wall diagrams, maps of mines, drawings of mine plant and machinery, models of head-frames, shafts, square set timbering, rock drills, hammers, picks, blasting apparatus, wire rope, screens, safety lamps, collection of minerals, anemometers, compasses, clinometers, dipping needles, transits, levels, barometers, and all the necessary instruments and equipment in surveying and mapping.

The mining laboratory is a model concentrating plant

that is fully equipped to crush, classify, separate and concentrate ores. The equipment consists of a Blake crusher, Cornish rolls, elevators, centrifugal pump, trommels, hydraulic classifiers, spitzkastens, a Willley shaking table, a slime table, New Century jigs, and a 10 h. p. motor to supply power.

The equipments of other departments available to the mining students are described in this catalogue as follows:

	Page.
GENERAL TESTING LABORATORY.....	45
HYDRAULIC LABORATORY.....	46
CHEMISTRY AND ASSAYING.....	74
ELECTRICAL ENGINEERING LABORATORY.....	63
MECHANICAL ENGINEERING LABORATORY.....	68

VACATION COURSES.

All students in the mining course are required to take the three weeks Summer school of surveying at end of Freshman year.

Two weeks in the Spring vacation of Junior and Senior years are spent in an actual mine survey, and in inspecting and studying the practical mining operations. Students are strongly advised to spend at least one Summer vacation during their course in actual work at the mines.

SYNOPSIS OF STUDIES.

MINING ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911

* See pages 85-137.

	Periods per week.	Course number.*
GERMAN†.....	4	75
OR		
FRENCH‡.....	4	115
ENGLISH.....	2	1
DRAWING AND LETTERING.....	2	441a-442a
THE BIBLE.....	1	221
HYGIENE.....	1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	926
GERMAN†.....	4	71
OR		
FRENCH‡.....	4	111
ENGLISH.....	2	2
DRAWING AND LETTERING.....	2	441b-442b
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY.....	4	416
MENSURATION.....	1	421
CHEMISTRY.....	2	927
GERMAN†.....	4	72
OR		
FRENCH‡.....	4	112
ENGLISH.....	2	3
DRAWING AND PROJECTIONS.....	2	441c
SURVEYING.....	2	601
THE BIBLE.....	1	223
SUMMER SCHOOL IN SURVEYING (in vacation)		
3 WEEKS.....	—	602

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY.....	2	417
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* See pages 85-137.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
CHEMISTRY.....	2	928
PHYSICS.....	4	461
SHOP WORK.....	2	1001
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451a
THE BIBLE.....	1	224
THEME.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
CHEMISTRY.....	2	929
PHYSICS.....	4	462
SHOP WORK.....	2	1002-3-4
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451b
THE BIBLE.....	1	225
THEME.		

Third Term.

APPLIED MECHANICS.....	4	621
CHEMISTRY.....	2	930
PHYSICS.....	4	463
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451c
MACHINE DRAWING.....	1 $\frac{1}{2}$	452
SHOP WORK.....	2	1005
ENGLISH.....	2	4
THE BIBLE.....	1	226
THEME.		

*JUNIOR YEAR.**First Term.*

APPLIED MECHANICS.....	4	622
MECHANICS OF MATERIALS.....	4	623
ELEMENTS OF ELECTRICAL ENGINEERING.....	4	804
METALLURGY.....	2	951
CRYSTALLOGRAPHY.....	2	511
MINE SURVEYING.....	2	701
BIBLE.....	1	233
THEME.		

* See pages 85-137.

Second Term.

	Periods per week.	Course number.*
METALLURGY.....	2	952
MECHANICS AND MATERIALS.....	4	624
STEAM ENGINEERING.....	4	1031
MECHANICAL ENGINEERING LABORATORY.....	1	1041
ELECTRICAL LABORATORY.....	2	827
PETROGRAPHY.....	2	512
MINE PROSPECTING.....	2	711
BIBLE.....	1	234
THEME. Spring vacation mine survey trip.		
SPANISH OR ITALIAN (optional).....	2	141-151

Third Term.

MINERALOGY.....	2	513
HYDRAULICS.....	3	661
RAILROADS.....	2	611
ELECTRICAL LABORATORY.....	2	828
MINE ENGINEERING.....	4	712-3
MASONRY.....	2	641
BIBLE.....	1	235
THEME.		
SPANISH OR ITALIAN (optional).....	2	142-152

SENIOR YEAR.

First Term.

GENERAL GEOLOGY.....	2	516
HYDRAULICS.....	3	662
MINE CONSTRUCTION.....	2	719
FIELD GEOLOGY.....	2	522
MACHINE DESIGN.....	2	1027
MINING ENGINEERING.....	4	714-5
BIBLE.....	1	242
THEME.		

Second Term.

GENERAL GEOLOGY.....	2	517
GEOLOGY OF ORE DEPOSITS.....	2	521
ASSAYING.....	2	955

* See pages 85-137.

	Periods per week.	Course number.*
MINING ENGINEERING.....	4	716-7
MINE CONSTRUCTION.....	2	720
BIBLE.....	1	243
THEME. Spring vacation mine inspection trip.		

Third Term.

PETROGRAPHY.....	2	525
GEOLOGY OF ORE DEPOSITS.....	2	522
MINE CONSTRUCTION.....	2	721
ORE DRESSING.....	4	731
MINE DRAINAGE.....	3	718
MINING LAW.....	2	752
BIBLE.....	1	244
THESIS.....	2	761

* See pages 85-137.

THE ELECTRICAL ENGINEERING COURSE.

The object of the course in Electrical Engineering is to give thorough instruction in such branches of engineering, both general and electrical, as shall fit the graduate to successfully meet and solve the problems which come to him as practicing electrical engineer. To this end, stress is laid on the attainment of a broad engineering and scientific training rather than on the specialization along any particular line or lines of Electrical Engineering. The aim is to train neither specialists nor artisans, but to give such instruction as shall enable the engineer to build up from the foundation of his knowledge of basic principles such specialized knowledge or reasoning as may be required to successfully meet the problem arising for solution.

The Freshman and Sophomore years are devoted to general instructional and culture courses. Thorough training is given in Mathematics, and Physics is taken throughout the Sophomore year, additional hours in elementary electricity and magnetism being given to the students from the Department of Electrical Engineering, so that they may be especially prepared to take up successfully their particular line of training during the last two years of their course.

Beginning with the Junior year, the fundamental principles of Electrical Engineering are studied in the class-room and worked out in the laboratory, the design room, and in problem work. The aim has been to so arrange these several lines that they shall be mutually

supplemental and thus give the student a clear, general conception of the principles involved, their correlation and relative importance.

The plan is continued throughout the Senior year as well, attention now being paid to the direct application of the theories and principles thus arrived at, to the various phases of present-day commercial practice, consideration being given to the financial and commercial as well as the engineering side.

The graduate is in this way prepared to take up in an effective and intelligent manner any branch of electrical engineering requiring general or special electrical training.

ELECTRICAL ENGINEERING LABORATORIES AND EQUIPMENT.

The laboratories are large and well arranged. The main electrical laboratory is thirty by sixty feet in dimensions, and is fitted up with representative types of continuous and alternating generators and motors, lamp-banks, water rheostats, brakes, etc.; and the necessary instruments are supplied for loading and testing generators and motors.

The laboratories are supplied from the Easton Power Company's station, with two-phase alternating current, at a frequency of sixty cycles. This current is available for testing purposes.

A fifty kilowatt motor-generator set has recently been installed for the purpose of supplying the laboratories with direct current. This set consists of a seventy-five horse power induction motor, directly connected to two twenty-five kilowatt, 120-volt direct current

dynamos, the current from which is supplied to the laboratories by means of the three-wire system.

In case of need, direct current from the plant of the Easton Power Company is also available.

While designed primarily as a source of direct current, this motor-generator set is so installed as to be available at all times for experimental tests by the students.

A portion of the laboratories is fitted up for the more delicate tests required. This consists of two rooms, each being about twenty-two feet square, containing the necessary instruments for accurate testing, among which are a Leeds and Northrup Potentiometer, a Thompson Quadrant Electrometer, D'Arsonval Galvanometers, Wheatstone Bridges, condensers, etc. Particular attention is paid to photometry of electric illuminants and specially fitted rooms have been provided for this work.

SYNOPSIS OF STUDIES.

ELECTRICAL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911
GERMAN†.....	4	75
OR		
FRENCH‡.....	4	115
ENGLISH.....	2	1
DRAWING AND LETTERING.....	2	441a-442a
THE BIBLE.....	1	221
HYGIENE.....	1	580

* See pages 85-137.

† Entered on German.

‡ Entered on French.

Second Term.

	Periods per week.	Course number.*
TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	926
GERMAN†.....	4	71
OR		
FRENCH†.....	4	111
ENGLISH.....	2	2
DRAWING AND LETTERING.....	2	441 ^b , 442 ^b
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY.....	4	416
MENSURATION.....	1	421
CHEMISTRY.....	2	927
GERMAN†.....	4	72
OR		
FRENCH†.....	4	112
ENGLISH.....	2	3
DRAWINGS AND PROJECTIONS.....	2	441 ^c
SURVEYING.....	2	601
THE BIBLE.....	1	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
SHOP WORK.....	2	1001
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2 ¹ / ₃	451 ^a
PHYSICS.....	6	461, 464
THE BIBLE.....	1	224
THEME.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
SHOP WORK.....	2	1002-3-4

* See pages 85-137.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
ENGLISH.....	2	4
PHYSICS.....	6	462, 465
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451b
THE BIBLE.....	1	225
THEME.		

Third Term.

ENGLISH.....	2	4
SHOP WORK.....	2	1004
APPLIED MECHANICS.....	4	621
PHYSICS.....	6	463, 466
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451c
MACHINE DRAWING.....	1 $\frac{1}{3}$	452
THE BIBLE.....	1	226
THEME.		

JUNIOR YEAR.

First Term.

APPLIED MECHANICS.....	4	622
MECHANICS OF MATERIALS.....	4	623
ELECTRICAL PROBLEMS.....	2	806
ALTERNATING CURRENT ENGINEERING.....	3	811
ELECTRICAL LABORATORY.....	2	821
ENGINEERING ABSTRACTS.....	1	831
THE BIBLE.....	1	233
THEME.		

Second Term.

MECHANICS OF MATERIALS.....	3	624
ELECTRICAL PROBLEMS.....	2	807
ALTERNATING CURRENTS.....	3	812
ELECTRICAL LABORATORY.....	2	822
ENGINEERING ABSTRACTS.....	1	831
STEAM ENGINEERING.....	4	1031
MECHANICAL ENGINEERING LABORATORY.....	1	1041
SPANISH (optional).....	2	141
ITALIAN (optional).....	2	151
THE BIBLE.....	1	234
THEME.		

* See pages 85-137.

Third Term.

	Periods per week.	Course number.*
HYDRAULICS.....	3	661
DIFFERENTIAL EQUATIONS.....	3	437
ENGINEERING ABSTRACTS.....	1	831
ELECTRICAL LABORATORY.....	2	823
ILLUMINATING ENGINEERING.....	4	851
MOTOR ENGINEERING.....	4	852
SPANISH (optional).....	2	142
ITALIAN (optional).....	2	151
THE BIBLE.....	1	235

THEME.

SENIOR YEAR.

First Term.

HYDRAULICS.....	3	662
ALTERNATING CURRENT CIRCUITS.....	4	814
ELECTRICAL LABORATORY.....	2	824
ENGINEERING ABSTRACTS.....	1	831
ELECTRICAL DESIGN.....	2	841
ELECTRICAL POWER TRANSMISSION.....	4	861
THE BIBLE.....	1	242

THEME.

Second Term.

POLITICAL ECONOMY.....	2	381
BUSINESS LAW.....	2	372
ELECTRICAL LABORATORY.....	2	825
ELECTRICAL POWER STATIONS.....	4	871
HYDRO-ELECTRIC ENGINEERING.....	3	872
ELECTRICAL DESIGN.....	2	842
ENGINEERING ABSTRACTS.....	1	831
THE BIBLE.....	1	243

THEME.

Third Term.

THE TELEPHONE.....	5	881
ELECTRICAL LABORATORY.....	2	826
ENGINEERING ABSTRACTS.....	1	831
ELECTRICAL RAILWAY ENGINEERING.....	5	853
THESIS.....	2	861
THE BIBLE.....	1	244

GRADUATION THESIS.

* See pages 85-137.

THE MECHANICAL ENGINEERING COURSE.

Of the four principal branches of engineering, the Mechanical, perhaps, is the least understood in its exact nature by the public-at-large, and, as a result, mechanical engineers are often confused with mechanics, or even firemen, all of whom are so frequently seen at their various duties. The men, however, who make possible these duties, who originate and design the tools and machines, and who superintend their use, are the true Mechanical Engineers, and it is the purpose of this course to educate young men to fill these higher positions.

A thorough grounding in Mathematics and Physics is required in the early part, and stress is laid upon English in order that the student, at all times, may express clearly and forcibly his ideas.

As far as possible all of the subjects are taken up in their natural sequence so that the successful completion of one may be the preparation for the next. Each of these studies is described in detail in the part of this bulletin entitled "Courses."

As much of the practical side of the profession as time permits is taken up, but the greater part of this must be acquired by actual experience. The courses in Shop Work are not expected to turn out skilled workmen, but are primarily intended to give instruction, to teach the uses and applications of the different tools and machines, to give the student a working idea of the possibilities of manufacture in order that his designing may be performed efficiently. Inspection trips are made from

time to time to near-by factories where the commercial side of the work may be seen.

From the courses pursued in the other Engineering Departments, sufficient knowledge of these branches is acquired to enable the Mechanical Engineer, while executing his own part of a work, to co-operate intelligently with the Civil, Electrical, or Mining Engineers, with whom he may be associated.

MECHANICAL ENGINEERING LABORATORIES AND EQUIPMENT.

The new Shop and Steam Laboratory, now in process of erection, is 102 feet wide, 183 feet long, and 40 feet from floor to peak of roof, and is constructed entirely of concrete, steel, brick, and glass, making a light airy building, absolutely fireproof. Two partitions 8 feet high extend down the center of the large room, forming a passage-way, to the left of which is the wood-working and machine shop, and to the right the steam laboratory and instructors' offices. At the back of these are the forge shop, the foundry, and the boiler room, connected with each of which is a storage room for the material to be used, and a coal bunker. A large toilet room, supplied with hot and cold water and fitted with individual lockers, is provided in the basement for the convenience of the students.

Each of the carpentry benches has a complete set of non-edged tools, and enough of the edged tools to assign a set to each man at the beginning of his course for his exclusive use throughout, and he is held responsible for their condition. This is an incentive for the student to keep his tools sharp, and is a great help in the production

of good work. There are also wood-turning lathes, power saws, planers, etc.

The foundry is supplied with a cupola, a soft metal furnace, a core oven, ladles, flasks, and all tools necessary to make moulds and turn out practical castings in brass or iron. A large bull-ladle of a capacity equal to that of the cupola is kept under the tap-spout at all times, that in case there should be a break at the breast no molten iron can spatter upon the floor and endanger the men. A dry grinder is provided for roughing off the castings.

The forge shop is equipped with student forges, and a large instructor's forge, all of the down-draft type, a power hammer, anvils, and all of the tools used for the shaping and welding of metals by this process.

The machine shop is fully equipped with vise benches for hand work, lathes, planers, shapers, milling machines, drill presses, power saw, grinding machine, filing machine, punch and press, and all small tools to go with each of the machines. All are motor-driven, and direct-connected wherever possible, making a light shop, eliminating the danger of bells, and also furnishing a convenient means for testing any of the machines, or tools of various makes of steel, under different conditions of operation. The gears are encased to give greater safety to the operator.

The steam laboratory is equipped with standard types of steam engines installed to run condensing or non-condensing, and to furnish experiments in testing, valve setting, etc., injectors, pumps, steam turbine, gas engines, and all instruments required for complete tests. The boiler room contains a fire tube and a water tube boiler, to furnish steam for the laboratory, and also to provide a convenient plant for instruction in firing, operating, and testing boilers.

All of the equipment is of full practical size of standard make, most modern design, and of a type that offers the greatest educational advantages. Every care has been taken to make all of the equipment as safe as possible for the unexperienced student. Certain machines are kept locked, and may be used only under the direct supervision of an instructor.

SYNOPSIS OF STUDIES.
MECHANICAL ENGINEERING COURSE.
FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911
GERMAN†.....	4	75
OR		
FRENCH‡.....	4	115
ENGLISH.....	2	1
DRAWING AND LETTERING.....	2	441a-442a
BIBLE.....	1	221
HYGIENE.....	1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	926
GERMAN†.....	4	76
OR		
FRENCH‡.....	4	116
ENGLISH.....	2	2
DRAWING AND LETTERING.....	2	441b-442b
BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY.....	4	416
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* See pages 85-137.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
MENSURATION.....	1	421
CHEMISTRY.....	2	927
GERMAN†.....	4	71
OR		
FRENCH†.....	4	111
ENGLISH.....	2	3
DRAWINGS AND PROJECTIONS.....	2	441c-442c
SURVEYING.....	2	601
BIBLE.....	1	224

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
PHYSICS.....	4	461
ENGLISH	2	4
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451a
CRYSTALLOGRAPHY.....	2	511
SHOP WORK.....	2	1001
BIBLE.....	1	224

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
PHYSICS.....	4	462
ENGLISH.....	2	4
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451b
PETROGRAPHY.....	2	512
SHOP WORK.....	2	1002-3-4
BIBLE.....	1	225

Third Term.

ENGLISH.....	2	4
PHYSICS.....	4	463
DESCRIPTIVE GEOMETRY.....	2 $\frac{1}{3}$	451c
MACHINE DRAWING.....	1 $\frac{1}{3}$	452
APPLIED MECHANICS.....	4	621

* See pages 85-137.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
TOOL DESIGN.....	3	1021
SHOP WORK.....	2	1005
BIBLE.....	1	226

JUNIOR YEAR.

First Term.

APPLIED MECHANICS.....	4	622
MECHANICS OF MATERIALS.....	4	623
ELEMENTS OF ELECTRICAL ENGINEERING.....	4	804
KINEMATICS.....	4	1022
SHOP WORK.....	2	1006-7
BIBLE.....	1	233

Second Term.

MECHANICS OF MATERIALS.....	3	624
ELECTRICAL LABORATORY.....	2	827
MACHINE DESIGN.....	3	1023
STEAM ENGINEERING.....	4	1031
MECHANICAL ENGINEERING LABORATORY.....	1	1041
SHOP WORK.....	2	1008
SPANISH (optional).....	2	141
ITALIAN (optional).....	2	151
BIBLE.....	1	234

Third Term.

HYDRAULICS.....	3	661
FRAMED STRUCTURES.....	2	690
ELECTRICAL LABORATORY.....	2	828
MACHINE DESIGN.....	2	1023
THERMODYNAMICS.....	2	1032
STEAM LABORATORY.....	1	1042
SHOP WORK.....	2	1009
SPANISH (optional).....	2	142
ITALIAN (optional).....	2	151
BIBLE.....	1	235

* See pages 85-137.

SENIOR YEAR.

First Term.

	Periods per week.	Course number.*
GRAPHIC STATICS.....	1	698
HYDRAULICS.....	3	662
ROOFS AND BRIDGES.....	2	691
MACHINE DESIGN.....	3	1024
THERMODYNAMICS.....	3	1032
ENGINEERING LABORATORY.....	2	1043
STEAM ENGINE DESIGN.....	3	1025
BIBLE.....	1	242

Second Term.

POLITICAL ECONOMY.....	2	381
BUSINESS LAW.....	2	372
GAS ENGINEERING.....	4	1051
POWER PLANT DESIGN.....	4	1026
ENGINEERING LABORATORY.....	2	1043
STEAM ENGINE DESIGN.....	3	1025
BIBLE.....	1	243

Third Term.

HEATING AND VENTILATING.....	3	1061
COMMERCIAL ENGINEERING.....	3	1071
POWER PLANT DESIGN.....	4	1026
ENGINEERING LABORATORY.....	2	1043
ELECTIVE.....	3	
THESIS.....	2	1081
BIBLE.....	1	244

* See pages 85-137.

THE CHEMICAL COURSE.

The aim of this course, which leads to the Degree of Bachelor of Science in Chemistry, is to fit young men for practical work in chemistry, either as chemists in iron and steel works, in manufacturing establishments, or as chemical manufacturers. Great attention is paid to analytical chemistry, and especially to the chemistry of cement and the chemistry and metallurgy of iron and steel. Graduates are fitted to take paid positions as chemists immediately upon graduation. For men of the proper character immediate and remunerative employment can be secured. This course will also be found an excellent preparation for the study of medicine.

Those who take the Chemical Course receive the same instruction in mathematics, drawing, shop-work, modern languages, physics and elementary chemistry up to and including elementary quantitative analysis during Freshman and Sophomore years.

During Junior and Senior years the courses diverge. Those especially interested in metallurgy and in the chemistry of cements and ceramics receive most of their instruction from Professors Hart and Wysor.

Those interested in Organic Chemistry are in charge of Professor Hart and Mr. Hess. Those interested in Physical Chemistry are instructed by Mr. De Long^T with the coöperation of Professor Gordon, of the Department of Physics. Those who expect to be Chemical Engineers are advised by Professors Hart and Wysor with the assistance of Professor Rood, of the Engineering De-

partment, while those interested in tanning will receive instruction from Professor Hart and Mr. Taylor with the coöperation of Professor Davison, of the Department of Biology.

Provision is made for new courses as the need arises. This is possible because the instruction is mainly individual and suited to the needs of each student.

While the instruction centers in the two branches of Chemistry and Metallurgy, the course aims to supply a thorough education along the lines most necessary for a successful career as a responsible chemist.

CHEMICAL AND METALLURGICAL LABORATORIES AND EQUIPMENT.

The Chemical and Metallurgical laboratories are contained in Gayley Hall, a new fire-proof structure built for the use of this Department. There are four large and four smaller laboratories and a shop, besides three stock rooms, two balance rooms, a quiz room, a lecture room, a room containing the museum and the books of the Henry W. Oliver Chemical and Metallurgical Library, and three rooms for instructors.

The two balance rooms adjoin the quantitative laboratory, and one of them may be entered from the qualitative laboratory.

The four large laboratories each have desk room for 48 students. Water and gas are supplied to each student, and each room is supplied with air blast and electric current. They are well lighted, and heated by steam. The smaller laboratories are arranged for assaying, industrial work, gas analysis, microscopic and photographic work, and various other determinations made with the polariscope, spectroscope, calorimeter, etc.



GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY.

For this and other work properly belonging to the department, there is an adequate equipment.

SYNOPSIS OF STUDIES.

CHEMICAL COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA.....	4	401
CHEMISTRY.....	4	911
GERMAN†.....	4	75
OR		
FRENCH‡.....	4	115
ENGLISH.....	2	I
DRAWING AND LETTERING.....	2	441a—442a
THE BIBLE.....	1	221
HYGIENE AND PHYSICAL CULTURE.....	1	580

Second Term.

TRIGONOMETRY.....	5	411
CHEMISTRY.....	2	912
GERMAN†.....	4	71
OR		
FRENCH‡.....	4	111
ENGLISH.....	2	2
DRAWING AND LETTERING.....	2	441b—442b
THE BIBLE.....	1	222

Third Term.

ANALYTICAL GEOMETRY.....	4	416
MENSURATION.....	1	421
CHEMISTRY.....	4	913
GERMAN†.....	4	72
OR		
FRENCH‡.....	4	112

* See pages 85-137.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
ENGLISH.....	2	3
DRAWING AND PROJECTIONS.....	2	441C-442C
THE BIBLE.....	1	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY.....	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS.....	3	426
CHEMISTRY.....	4	914
ENGLISH.....	2	4
PHYSICS.....	4	461
SHOP WORK.....	2	1001-02
THE BIBLE.....	1	224
THEME.		

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS.....	5	427
CHEMISTRY.....	4	915
PHYSICS.....	4	462
ENGLISH.....	2	4
SHOP WORK.....	2	1003-04
THE BIBLE.....	1	225
THEMES.		

Third Term.

CHEMISTRY.....	4	916
PHYSICS.....	4	463
ENGLISH.....	2	4
CHEMICAL ARITHMETIC.....	4	917
SHOP WORK.....	2	1004
THE BIBLE.....	1	226
THEMES.		

JUNIOR YEAR.

First Term.

CRYSTALLOGRAPHY.....	2	511
QUANTITATIVE ANALYSIS.....	5	918
THEORETICAL CHEMISTRY.....	2	919
ORGANIC CHEMISTRY.....	3	920
METALLURGY.....	2	951

* See pages 85-137.

	Periods per week.	Course. number*
TECHNICAL GERMAN.....	1	961
BIBLE.....	1	233
THEMES.		

Second Term.

PETROGRAPHY.....	2	512
QUANTITATIVE ANALYSIS.....	5	931
THEORETICAL CHEMISTRY.....	2	925
ORGANIC CHEMISTRY.....	3	921
METALLURGY.....	2	952
TECHNICAL GERMAN.....	1	962
SPANISH (optional).....	2	141
ITALIAN (optional).....	2	151
BIBLE.....	1	234
THEME.		

Third Term.

QUANTITATIVE ANALYSIS.....	4	932
THEORETICAL CHEMISTRY.....	2	925
ORGANIC CHEMISTRY.....	4	922
MINERALOGY.....	3	513
SANITARY BIOLOGY.....	2	561
TECHNICAL GERMAN.....	1	963
SPANISH (optional).....	2	142
ITALIAN (optional).....	2	152
BIBLE.....	1	235
THEME.		

SENIOR YEAR.

First Term.

QUANTITATIVE ANALYSIS.....	10	933
CHEMICAL TECHNOLOGY.....	2	934
GEOLOGY.....	2	516
TECHNICAL GERMAN.....	1	964
BIBLE.....	1	242

Second Term.

ANALYTICAL CHEMISTRY (Thesis Work).....	6	971
CHEMICAL ENGINEERING.....	2	935

* See pages 85-137.

	Periods per week.	Course number.*
ASSAYING.....	2	955
GEOLOGY.....	2	517
ECONOMIC GEOLOGY.....	2	521
POLITICAL ECONOMY.....	2	381
TECHNICAL GERMAN.....	1	965
BIBLE.....	1	243
THEME.		

Third Term.

ANALYTICAL CHEMISTRY (Thesis Work).....	12	972
ECONOMIC GEOLOGY.....	2	521
TECHNICAL GERMAN.....	1	966
BIBLE.....	1	244

* See pages 85-137.

COURSES.

ENGLISH LANGUAGE, ENGLISH LITERATURE,
COMPARATIVE PHILOLOGY.

*Professors F. A. March, Jr., J. W. Tupper, and Messrs.
Linn, Mackinnon, Bye and Cooke.*

The work in this department aims, first, to train the student in speaking and writing English correctly. This training begins with the theme work in the Freshman year and is continued throughout the course.

The work in the upper classes is divided into the study of the language and the study of the literature. Its purpose is the interpretation of masterpieces, the re-thinking of the thoughts of master minds. The study of the language consists of a study of the principles of grammar, rhetoric, etymology, phonetics, prosody, and other material of philological investigation according to the progressive course outlined in Dr. March's *Method of Philological Study of the English Language* and the application of the results of such work to the text of some standard author. Bunyan, Spenser, Chaucer, Shakespeare, Bacon and Milton are taken up in this way, and courses in fiction and the drama are given associated with an examination of the language of some novel or play. This course ends with the study of Dr. Whitney's *Lectures on Language*.

The work in English Literature consists of a course of lectures beginning with the Elizabethan period and continuing down to the present time. The course extends over the Junior and Senior years and is accom-

panied by special reading and by weekly and term reports.

Dr. March's Anglo-Saxon Grammar and Reader is used as the basis for a course in Anglo-Saxon given in connection with the study of the English Language.

For training in speaking and writing English correctly every student is required to hand in two themes in every term in his College course after Freshman year. Many of them are read in class and criticized as time allows. In this work professors of all departments take part. It is desired that students in each department shall write on subjects connected with it in the words and phrases current among experts, and know the precise meaning of these words and phrases. In these matters the professors in each department are authorities.

- 1-2-3. COMPOSITION AND RHETORIC.—Themes. Conferences every two weeks. Outside reading. First, second and third terms, Freshman year. Two periods per week.
4. ENGLISH LITERATURE AND COMPOSITION.—Preparation 1-2-3. The study of the leading English authors from the Elizabethan period to the present time. Lectures and recitations, outside reading and reports. First, second and third terms, Sophomore year. Two periods per week.
10. ANGLO-SAXON.—March's Anglo-Saxon Grammar and Reader. Second term, Sophomore year. Two periods per week.
- 11-12-13. ADVANCED ANGLO-SAXON.—Preparation: 10: March's Anglo-Saxon Grammar and Reader and additional reading as assigned. Gilbert Prize in Old English (see page 169). First, second and third terms, Junior or Senior year. One period per week.
14. ENGLISH LANGUAGE.—Trench on the Study of Words. Trench Prize (see page 168). First term, Sophomore year. Two periods per week.

15. ENGLISH LANGUAGE.—Sentence Construction. First, Second and Third term, Sophomore year. Two periods per week.
16. ENGLISH LANGUAGE.—Bunyan's Pilgrim's Progress, English Syntax, Rhetorical Forms, Grammatical Equivalents, Essays on Bunyan's Life, Times and Works. First term, Sophomore year. Two periods per week.
17. ENGLISH LANGUAGE.—Spenser's Faery Queen, Etymology, Romance of Chivalry, Spenserian Stanza, Essays on Spenser's Life, Times and Works. Second term, Sophomore year. Two periods per week.
18. ENGLISH LANGUAGE.—Chaucer's Canterbury Tales, Phonetics Orthographic Forms, Essays on Chaucer's Life, Times and Works. Lounsbury Prize (see page 167). Second term, Sophomore year. Four periods per year.
- 19.—ENGLISH LANGUAGE.—Shakespeare. Lectures, Weekly Essays on Shakespeare's Life, Times and Works. Two periods per week. Francis Bacon: Study of the Essays. Lectures, Weekly Essays on Bacon's Life, Times and Works. First term, Junior year. Two periods per week.
20. ENGLISH LANGUAGE —Shakespeare. Study of Hamlet and other Shakespearean Tragedies. Two periods per week. John Milton: Study of His Poetic Works. Weekly Essays on Milton's Life, Times and Works. Two periods per week. Second term, Junior year.
21. ENGLISH LANGUAGE.—Study of As You Like It and other Shakespearean Comedies. Lectures, Weekly reports, Dramatic Criticism. Shakespeare Prize (see page 171). Two periods per week. Edgar Allen Poe: Poems and Tales. Essays and reports on Poe's Times and Works. Two periods per week. Third term, Junior year.
22. ENGLISH LANGUAGE.—English Fiction. Lectures, Assigned Reading, Book Criticism, Weekly Essays. Two periods per week. Sheridan: Study of the Rivals. Essays on Sheridan's Times and Works. Two periods per week. The Francis A. March Prize (see page 167). First term, Senior year.
23. ENGLISH LANGUAGE.—The English Drama. Lectures and re-

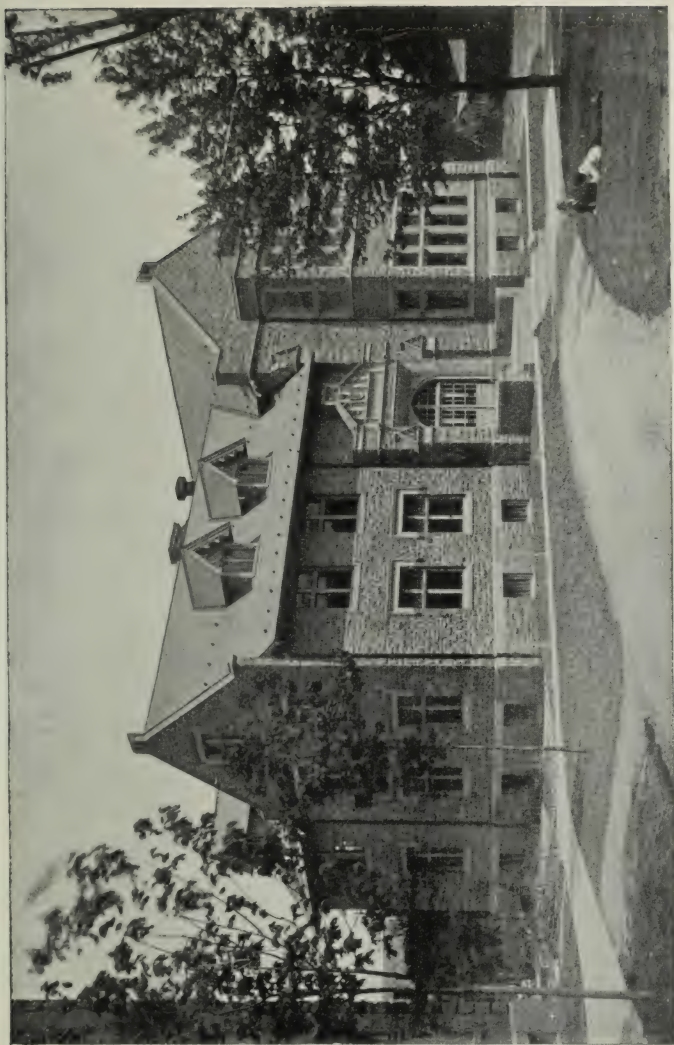
quired reading. Two periods per week. English Fiction (continued). Two periods per week. Second term, Senior year.

24. ENGLISH LANGUAGE.—The English Drama. Study of Assigned Texts. Lectures. Weekly Reports. Two periods per week. English Fiction (concluded). Two periods per week. Third term, Senior year.
- 30-31. COMPARATIVE PHILOLOGY.—Whitney's Language and the Study of Language. Third term, Senior year. Three periods per week.
- 41-42. SIXTEENTH AND SEVENTEENTH CENTURY LITERATURE.—Lectures, weekly reports, assigned reading. First and second terms, Junior and Senior years. Four periods per week.
43. EIGHTEENTH CENTURY LITERATURE.—Lectures, weekly reports, assigned reading. Third term, Junior and Senior years. Four periods per week.
44. THE ROMANTIC POETS, 1790-1832.—Lectures, weekly reports, assigned reading. First term, Junior and Senior years. Four periods per week.
- 45-46. LATER NINETEENTH CENTURY LITERATURE.—Lectures, weekly reports, assigned reading. Second and third terms, Junior and Senior years. Four periods per week.
- 41-42-43. Given in 1912-13.
- 44-45-46. Given in 1911-12.

ELOCUTION.

Prof. March, Jr., and Mr. Linn.

- 51-52. ELOCUTION.—Delivering of selected pieces. Required in the Classical and Latin Scientific Courses. Optional in all others. Second and third terms, Freshman year.
- 53-54-55. ELOCUTION.—Delivering of selected pieces. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First, second and third terms, Sophomore year.
- 56-57-58. ELOCUTION.—Delivering of original addresses on chosen



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subjects. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First, second and third terms, Junior year.

59-60. ELOCUTION.—Delivering of unwritten addresses on assigned subjects. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First and second terms, Senior year.

61. ELOCUTION.—Graduating Orations. Required in the Classical, Latin Scientific and General Scientific Courses. By special appointment in all others. Third term, Senior year.

GERMAN AND ROMANCE LANGUAGES.

Professors Raschen and Hopkins and Messrs. Larned, Hill and Jelleson.

Courses 71, 72 are prescribed for technical students who have entered on French. 75 is prescribed for technical students who have entered on German.

71. ELEMENTS OF GERMAN.—Elements of Grammar and Syntax. Prose Composition followed by reading of easy narrative German prose. Second term, Freshman year. Four periods per week.

72. INTERMEDIATE GERMAN.—Preparation: 71. Reading of narrative prose of difficult character. Composition. Third term, Freshman year. Four periods per week.

75. ADVANCED GERMAN.—Preparation: Entrance German B.—The first two weeks will be devoted to a rapid, thorough review of the principles of syntax. This is followed by composition and reading from modern writers as Riehl, Wildenbruch, Fulda, etc., and the translation of easy scientific German. Part of the term will be devoted to reading of scientific German of an advanced character. First term, Freshman year. Four periods per week.

80. ELEMENTS OF GERMAN.—Prescribed for Sophomores in the Classical Course. This Course, in conjunction with Course 81, aims to give a thorough and accurate training in the rudiments of Grammar; to familiarize the student with spoken

German as well as written; for this reason the inductive method will be employed, using German almost entirely from the beginning. In this manner the student is quickly made to acquire both "Sprachgefuehl" and "Sprachmaterial" so as to read German with ease. Composition and translation of easy graduated text forms part of the exercise each hour. Third term, Sophomore year. Three periods per week.

81. ELEMENTS OF GERMAN.—(Continued).—Prescribed for Juniors in the Classical Course. First term, Junior year. Three periods per week.
- 82-83. INTERMEDIATE GERMAN.—Preparation: 81. Reading of novels and dramas by modern writers such as Heyse, Keller, Fulda, Mörike, Sudermann. Second and third terms, Junior year. Two periods per week.
- 84-85-86. ADVANCED GERMAN.—Preparation: Entrance, German A. Prescribed for Freshmen in the Latin Scientific Course. The study of accidence, syntax and etymology will form part of this course. In connection with this, there will be oral practice in German and Composition as well as reading of advanced texts. These texts will be selected so as to vary the reading and to acquaint the student with a variety of style of German writers. In addition to this an easy text will be assigned for outside reading during the second and third terms. First, second and third terms, Freshman year. Four periods per week.
- 87-88. NINETEENTH CENTURY WRITERS.—Preparation: 86. Prescribed for Sophomores in the Latin Scientific Course who have entered on German. This course consists of the study of Prose-fiction of the 19th century. The classes will be conducted in German as far as practicable. Written exercises in German will constitute part of the work. First and second terms, Sophomore year. Two periods per week.
89. HISTORICAL PROSE.—Preparation: 88. Prescribed for Sophomores who have entered on German. Selected readings from German historical writers, and from addresses in the Reichstag. Third term, Sophomore year. Two periods per week.

- 90-91-92. SCHILLER AND GOETHE.**—Preparation: 89. The lives and several of the principal works of these authors will be studied. Lectures on the various aspects of these works are given to supplement the studies and readings in biography and criticism assigned. Elective. First, second and third terms, Junior year. Two periods per week.
- 93-94-95. GOETHE'S FAUST.**—Preparation: 92. Alternates with 96-98. The reading and interpretation of Faust, the First Part in its entirety, the Second Part in selected portions. The study will comprise its genesis, significance, ethics, and artistic character. It is open to those who complete the course on Goethe. Elective. First, second and third terms, Senior year. Two periods per week.
- 96-97-98. HISTORY OF THE GERMAN DRAMA OF THE 19TH CENTURY.**—Preparation: 87-89. The reading and criticism of the various types of modern drama together with a study of their sources and influence. (Alternates with 93-95; not given in 1912.) Elective. First, second and third terms, Senior year. Two periods per week.
- 99-100-101. HISTORY OF GERMAN LITERATURE;** from the earliest beginnings to the end of the Eighteenth Century.—Preparation: 87-89 or 90-92. Lectures and collateral reading and study of the literary movements in Germany. First, second and third terms, Senior year. Two periods per week.

FRENCH.

Courses 111, 112 are prescribed for technical students who have entered on German.

- 111. ELEMENTS OF FRENCH.**—Elements of German and Syntax. Prose composition in connection with reading of easy narrative French prose. Second term, Freshman year. Four periods per week.
- 112. INTERMEDIATE FRENCH.**—Preparation: 111. Reading from Scientific Prose. Third term, Freshman year. Four periods per week.

Course 115 is prescribed for technical students who have entered on French.

115. **ADVANCED FRENCH.**—Preparation Entrance French B. The course will comprise French prose composition and reading of standard French authors. First term, Freshman year. Four periods per week.
126. **ELEMENTARY FRENCH.**—Prescribed for Sophomores in the Classical and Latin Scientific Courses. Fraser and Squair's Grammar; composition; sight reading and translation of easy prose; careful drill in pronunciation. First term, Sophomore year. Two periods per week.
127. **FRENCH.**—Continuation of foregoing; thorough study of irregular verbs; grammar; composition; translation; sight-reading. Second term, Sophomore year. Two periods per week.
128. **FRENCH.**—Grammar and composition continued; translation and sight-reading from Guerlac's Standard French Authors; discussion of the various works of the authors represented. Comfort's Prose Translation. Third term, Sophomore year. Two periods per week.
129. **FRENCH.**—Readings in French history; discussions. First term, Junior year. Two periods per week.
130. **FRENCH.**—The Novel. Selections from Dumas' *Les Trois Mousquetaires* or Hugo's *Notre Dame*. Lectures. Second term, Junior year. Two periods per week.
131. **FRENCH.**—The School of the Realists. Readings from Zola's *Débacle*. Collateral reading in History of French Literature. Lectures. Third term, Junior year. Two periods per week.
132. **FRENCH.**—The Classical Drama—Tragedy. Study of the works of Corneille, Racine and Rotrou. Lectures. First term, Senior year. Two periods per week.
133. **FRENCH.**—The Classical Drama—Comedy. Works of Molière. Lectures. Second term, Senior year. Two periods per week.
134. **FRENCH.**—Rise of the Romantic School. Hugo's *Ruy Blas* or *Hernani*. Lectures. Third term, Senior year. Two periods per week.
135. **FRENCH.**—The Literature of the XVIth Century. Selec-

tions from Ronsard Marguerite de Valois, Marot, Jodelle, etc. The *Pléiade*. Alternates with 133. Second term, Senior year. Two periods per week.

136. FRENCH.—Historical Grammar. Development of French from Latin. Alternates with 133–134. Third term, Senior year. Two periods per week.

SPANISH.

141. SPANISH.—This course is designed to give the elements of Spanish grammar and to enable the student to translate easy prose from English into Spanish and *vice versa*. Second term, Junior or Senior year. Two periods per week.
142. SPANISH.—Continuation of 141. Third term, Junior or Senior year. Two periods per week.

ITALIAN.

151. ITALIAN.—Elements of Italian grammar. Translation of prose from Italian into English and *vice versa*. Second term, Junior or Senior year. Two periods per week.
152. ITALIAN.—Continuation of 151. Third term, Junior or Senior year. Two periods per week.

THE GREEK LANGUAGE AND LITERATURE.

Professors Youngman (Professor Emeritus) and Rankin.

The aim in the Greek courses leading to the A.B degree is to secure a mastery of the language, for which an exact knowledge of forms of words and of the essential principles of syntax is indispensable. Particular attention is paid to the study of Greek Prose during the first term of Freshman year. A correct understanding of the significance of words is also sought through the study of their inherent root meanings, while Greek idioms and forms of expression are learned by way of contrast with those of the Latin and English languages.

But the chief end in view is to acquire an appreciation

of Greek Literature and, through this medium, of the Greeks themselves. The History of Greek Literature is learned through association of authors with contemporaneous historical events. The political history and institutions of the Greeks, their daily life, their customs and their religious beliefs are studied hand in hand with their language and literature. The student is encouraged to read largely in the representative authors selected for study in the class-room. Themes on subjects drawn from various phases of Greek life are required in connection with the regular work. In this way the close relationship of the Greek of Classical times and the man of to-day is more perfectly realized.

In the required work of the first two years the prose writers are represented in the reading of the early Attic orators, of Herodotus, of Xenophon, and of Plato. In poetry large parts of both Iliad and Odyssey are read, and the student is introduced to the Greek Drama in plays of Sophocles, Euripides and Aristophanes.

In the elective Greek, for the present courses are offered to qualified Juniors and Seniors, four hours a week, throughout the year. For 1912-1913 the courses offered will comprise the study of Demosthenes and Aeschines on the Crown and the reading of selected plays of Sophocles and Aeschylus. This reading will be accompanied by parallel reading in the history and constitutional antiquities of the period represented and in the origin and development of the Greek Drama. During 1913-1914 courses will be offered in selected plays of Aristophanes and Menander, representing the Old and the New Comedy, in Thucydides, and in the Lyric Poets and Theocritus.

Additional courses will be offered, by way of substitution, from time to time in Lucian, in Aristotle's *Poetics* and *Constitution of Athens* and in Plato's *Protagoras* and *Republic*.

Following is a synopsis of the courses offered.

161. LYSIAS, the oration against Eratosthenes and some of the shorter orations (Adams). Plato, *The Apology*, and Xenophon, selections from the *Memorabilia* (Dyer and Seymour). Greek Prose Composition (Higley). First term, Freshman year. Four periods per week.
162. HERODOTUS, books VII and VIII (Smith and Laird). "A History of Greece," Oman, to Chapter XXVIII (the death of Pericles, 429 B. C.). Second term, Freshman year. Four periods per week.
163. HOMER, *The Iliad*, books XIX-XXIV (Clapp). "A History of Greece," Oman, from the death of Pericles to the death of Alexander the Great, 323 B. C. Third term, Freshman year. Four periods per week.
164. HOMER, *The Odyssey*, books I-XII (Merry). "Life of the Ancient Greeks," Gulick. Themes on Greek Life. First term, Sophomore year. Four periods per week.
165. "SELECTIONS FROM THE ATTIC ORATORS," Jebb. "Greek Literature," Jebb. Second term, Sophomore year. Four periods per week.
166. INTRODUCTION TO THE GREEK DRAMA. Euripides, *Iphigenia among the Taurians* (Jerram); Sophocles, *Antigone* (Jebb and Schuckburgh); Aristophanes, *The Clouds* (Merry). Assigned reading in the history of the Greek Drama and in scenic antiquities. Third term, Sophomore year. Four periods per week.
167. DEMOSTHENES AND AESCHINES ON THE CROWN (Simcox and Simcox). Review of the period of Philip and Alexander. Greek Constitutional Antiquities. Elective. First term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1912-1913.)

168. GREEK TRAGEDY. Sophocles, *Oedipus the King* (Jebb), *Oedipus at Colonus* (Jebb and Schuckburgh), and *Electra* (Jebb and Davies). Parallel reading in works on the Greek Drama. Elective. Second term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1912-1913.)
169. GREEK TRAGEDY. Aeschylus, *Prometheus Bound* (Prickard), *Seven against Thebes* (Sidgwick), *Eumenides* (Sidgwick). Parallel reading. Elective. Third term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1912-1913.)
170. GREEK COMEDY. Aristophanes, *Birds*, *Frogs*, and *Acharnians* (Merry). Menander, fragmentary plays (Capps). Elective. First term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1913-1914.)
171. THUCYDIDES, books VI and VII (Lamberton). Review of the period of the Sicilian Expedition. Elective. Second term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1913-1914.)
172. LYRIC POETS, selections (Tyler). Theocritus (Holmeley). Elective. Third term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1913-1914.)

For students who do not offer Greek for entrance the following courses are available and may be substituted, throughout the year, for certain other courses in the College curriculum. (See page 43).

179. BEGINNER'S GREEK BOOK (Benner and Smyth). Xenophon, *Anabasis*, books I and II (Smith). Sub-Freshman course, four periods per week, through the entire year.
180. XENOPHON, *Anabasis*, books II-IV (Smith). Homer, *the Iliad*, books I-III (Seymour). Sub-Freshman course, four periods per week, through the entire year.

THE LATIN LANGUAGE AND LITERATURE.

Professor Owen and Messrs. Lacey and Larned.

It is the aim of this Department to give the students an intelligent acquaintance with the language, literature, and institutions of Rome, and qualify them for the efficient treatment of these subjects as teachers, or for the further scholarly pursuit of these and kindred studies after graduation if they should be so disposed. An effort is made to unite accuracy in details with facility in reading within the limits of a reasonable range.

It is kept in mind, also, that the training in this Department should be practically helpful and valuable to those who are to speak and write the English language. With a view to cultivate the power of expression, besides the oral work of the class-room, there are frequent exercises in writing, in which it is sought to faithfully render the author into the English of our literary standards.

181. LIVY.—Books XXI–XXII, with Roman History and Latin Prose. First term, Freshman year. Four periods per week.
182. HORACE.—Odes and Epodes. Latin Prose. Second term, Freshman year. Four periods per week.
183. HORACE.—Satires and Letters with Roman Antiquities. Third term, Freshman year. Four periods per week.
184. CICERO.—De Oratore with history of the last Century of the Roman Republic. First term, Sophomore year. Four periods per week.
185. LATIN HYMNS.—Latin Hymns with Early Roman Literature. Second term, Sophomore year. Four periods per week.
186. CICERO.—De Officiis. Third term, Sophomore year. Two periods per week.
187. TACITUS.—Agricola and Germania. Roman Literature of

the Silver Age. First term, Junior year. Two periods per week.

188. JUVENAL.—Roman Archaeology, illustrated by an Extensive Collection of Roman photographs. Second term, Junior year. Two periods per week.
189. TACITUS.—Annals. Third term, Junior year. Two periods per week.
190. LUCRETIVS.—First term, Senior year. Two periods per week.
191. EPISTOLARY LATIN.—Pliny and Cicero. Second term, Senior year. Two periods per week.
192. CICERO'S TUSCULAN DISPUTATIONS.—Third term, Senior year. Two periods per week.

THE HEBREW LANGUAGE.

Rev. Robert Robinson.

201. ELEMENTARY HEBREW.—Etymological principles of Hebrew; inflexions and laws of euphonic changes. Elective. Second term, Senior year. Two periods per week.
202. HEBREW (Continued).—Translation of portions of Old Testament History from Hebrew into English, and from English into Hebrew. Elective. Third term, Senior year. Two periods per week.

THE BIBLE.

The President, Professors Youngman, Hardy, Owen, Raschen, Roberts, Lyle, Rankin, Hopkins, Marquard and Messrs. Smith, Lacey, Cawley, Hatch, Larned, Linn and Mackinnon.

In the Freshman year a general survey of the Bible will be made with the purpose of impressing upon the students the character of its contents, the various books and their relation to the whole, and familiarizing them

with its actual language and ideas. So far as may be profitable for this dominant purpose, instruction will be given in Bible history and geography, but the great object is to make the student familiar with the very words of the English Bible.

The Sophomore year is devoted to a detailed study of one of the synoptic gospels. Those who study Greek use the Greek Testament; those taking the Latin Scientific course, a Latin version; and the Technical students use a French version.

The Acts of the Apostles is studied in the Junior year. Special attention is given to the lives and labors of the Apostles and the founding of the Christian Church.

In the Senior year the first half year is devoted to a course in the early history of Christianity in which Uhlhorn's Conflict of Christianity with Heathenism is the text-book; the second half to the external history of the English Bible, its translators and translation.

221-22-23. THE BIBLE.—General survey of the Old Testament and the Life of Christ. Required of all students throughout the Freshman year. One period per week.

224-25-26. THE NEW TESTAMENT.—The Gospels, in French. Required of Technical students throughout the Sophomore year. One period per week.

227-28-29. THE NEW TESTAMENT.—The Gospels, in Greek. Required of Classical students throughout the Sophomore year. One period per week.

230-31-32. THE NEW TESTAMENT.—The Gospels, in Latin. Required of Latin Scientific students throughout the Sophomore year. One period per week.

233-34-35. THE NEW TESTAMENT.—The Acts of the Apostles, in German. Required of Technical and General Scientific students throughout the Junior year. One period per week.

- 236-37-38. THE NEW TESTAMENT.—The Acts of the Apostles in the Greek. Required of Classical students throughout the Junior year. One period per week.
- 239-40-41. THE NEW TESTAMENT.—The Acts of the Apostles, in Latin. Required of Latin Scientific students throughout the Junior year. One period per week.
- 242-43. CHURCH HISTORY.—Uhlhorn's Conflict of Christianity with Heathenism. Required of all students. First and second terms, Senior year. One period per week.
244. HISTORY OF THE ENGLISH BIBLE.—Required of all students. Third term, Senior year. One period per week.

PHILOSOPHY.

Professor Mecklin.

The required courses in Philosophy are Logic, Psychology, Introduction to Philosophy, Ethics, and Theism. They are continuous and cover five consecutive terms beginning with the first term of the Junior year. In addition to these, elective courses are offered in the History of Philosophy, Advanced Psychology, the Psychology of Education and the History of Education.

251. LOGIC.—Two hours a week during the first term and it may be taken either the Junior or the Senior year. The aim of this course is to acquaint the student with the laws of discursive thinking, particular emphasis being laid upon ambiguity, the fallacies and the principles of scientific method (Creighton, *An Introductory Logic*, or Bode, *An Outline of Logic*).
252. PSYCHOLOGY.—Three hours a week during the second term of the Junior year. In this course the student gains a knowledge of the simpler facts of the mental life and their relations to the physiological basis in the sense organs and the nervous system. The lectures are supplemented by parallel reading and simple experiments and exercises (Angell, *Psychology*).

253. **ADVANCED PSYCHOLOGY.**—Two hours a week during the first term of the Senior year. This is a continuation of Course 252 and is intended to supplement the course in Ethics and Education. It consists of lectures and parallel readings with reports.
254. **INTRODUCTION TO PHILOSOPHY.**—Two hours a week during the third term of the Junior year. This course is designed to introduce the student to the main problems of Epistemology and Metaphysics and to acquaint him with the scope and relations of special philosophical disciplines (Kuelpe, *Introduction to Philosophy* or Jerusalem, *Introduction to Philosophy*).
281. **ETHICS.**—Three hours a week during the first term of the Senior year. The facts of the moral life are presented as a series of problems such as the problem of the origin of moral sentiment, of the content of moral judgment, of the end or standard, etc. The method adopted is genetic, and ultimate principles are attained through an analysis of the familiar facts of experience (Muirhead, *The Elements of Ethics*, or Dewey and Tufts, *Ethics*).
291. **ANCIENT AND MEDIAEVAL PHILOSOPHY.**—Two hours a week during the first term of the Senior year. This course traces the rise and development of the philosophical impulse through the Greek, the Greco-Roman and the mediaeval periods. The attempt is made to correlate the various philosophical tendencies with the civilizations that fostered them (Weber, *History of Philosophy*, Rogers, *Student's History of Philosophy*, Windelband, *A History of Philosophy*).
292. **MODERN PHILOSOPHY FROM DESCARTES TO HEGEL.**—Two hours during the second term of the Senior year. In this course, which is a continuation of Course 291, the classical philosophical systems from Descartes to the German Idealists are discussed and analyzed. Rand's, *Modern Classical Philosophers* is used as parallel reading.
293. **PHILOSOPHY OF THE NINETEENTH CENTURY.**—Two hours during the third term of the Senior year. A continuation of

Courses 291 and 292, in which particular attention is given to the philosophical tendencies of the present time.

301. HISTORY OF EDUCATION.—Two hours a week during the second term Senior. Text-book, Monroe's *A Brief Course in the History of Education*, with parallel reading and reports.
302. THEISM.—Two hours a week during the first term of the Senior year. This course sets forth the grounds of theistic belief as necessary to a broad and liberal culture and sound Christian scholarship. The anti-theistic theories such as pantheism, materialism, positivism, etc., receive critical attention. (Flint, *Theism and Anti-Theistic Theories*.)
303. PSYCHOLOGY OF EDUCATION.—Two hours during the third term of the Senior year. Text-book, Bagley's *Educative Process* or Horne's *Psychological Principles of Education*.

HISTORY, POLITICAL AND SOCIAL SCIENCE.

The President and Professors Owen, Roberts and Rankin, and Messrs. Lacey, Kirkpatrick, Larned and Linn.

The work of this department is designed to give such a general knowledge of History and Political Science as belongs to a liberal education. At the same time sufficient work is offered in the electives to well equip for their future work and study students who desire to take up graduate work or to engage in the practice of law or the public service or teaching. The instruction is given by text-books, by lectures, and by library references, the students reporting the results of their reading partly during the regular work of the class, and partly in the form of essays. The subjects covered by the course are in detail as follows:

311. ANCIENT HISTORY.—Survey of the history of Greece and Rome in connection with the courses in Latin and Greek. Political, Social, literary and philosophical history of each epoch. Classical Geography.

312. ANCIENT HISTORY.—This course covers the field of general history from the earliest times to the downfall of the Western Roman Empire. The methods comprise a text-book, lectures, collateral reading, and frequent written tests. First term, Sophomore year. Two periods per week.
313. MEDIAEVAL AND MODERN EUROPEAN HISTORY.—This is a general course in European History from the Teutonic Migrations. Second and third terms, Sophomore year. Two periods per week.
- 321-22. HISTORY OF ENGLAND.—The narrative History of England is made the basis of study, but especial attention is given to the economic, social and intellectual history of the country, and to the development of English institutions. The general aim of this course, in its method, is to prepare for the courses in American History. Green's Short History of the English People is used as a text-book, and the importance of collateral readings is emphasized. First and second terms, Junior year. Two periods per week.
331. AMERICAN HISTORY.—The course in Colonial History is intended to trace the beginnings of the American nation rather than the details of the history of the individual colonies. Emphasis is therefore laid on the European inheritance brought to this country by the colonists, their development of American institutions in the new environment, the expansion of population, the struggle between France and England for North America, the underlying causes of the Revolution, the growth of independence and union. Thwaite's *The Colonies* and Hart's *Formation of the Union* are used as text-books, supplemented by lectures, reading and reports. Second term, Junior year. Two periods per week.
334. AMERICAN HISTORY AND CIVICS.—A one-year course for the General Scientific students in the literature division of that course. Freshman year. Two periods a week.
351. CONSTITUTIONAL HISTORY.—The United States. A required course dealing with the Constitution from the point of view of its historical development. Fiske's *Critical Period of American History* is used as an introduction to this course, and

it is accompanied by a critical study of several important constitutional documents, such as Magna Charta, the Petition of Right, the Articles of Confederation, and the Ordinance of 1787. Then the Constitution is taken up section by section and studied with reference to its historical development and its subsequent interpretation and construction. Third term, Junior year. Four periods per week.

352-53. CONSTITUTIONAL HISTORY.—The United States (Continued). Preparation: 351. Detailed study of the subject, with Bryce's *American Commonwealth* as an introduction and general guide. Lectures, discussions and written reports on questions of American citizenship. Elective. Second and third terms, Senior year. Two periods per week.

361-62-63. GENERAL CONSTITUTIONAL HISTORY.—An elective course in General Constitutional History is begun in the first term of the Senior year and continued through the second and third terms. It begins with the origin of the state, and following the plan of Woodrow Wilson's *The State* pursues the development down to the present time. The recitations are supplemented by lectures and reading, with written reports of investigations. Two periods per week.

371-72. LAW.—Elective courses in Blackstone's Commentaries and Business Law. Second and third terms, Senior year. Two periods per week.

376. INTERNATIONAL LAW.—The course in International Law undertakes to do little more than to exhibit the fundamental principles which govern international affairs, and by the study of a few important cases to show the method of diplomatic procedure. It is especially intended to give the students the information needed to understand current discussions of foreign relations. Text-book—Lawrence's *Principles of International Law*. First term, Senior year. Two periods per week.

381-82. POLITICAL ECONOMY.—The course in Political Economy consists of a rapid survey of the principles during second term, Senior year, and of the discussion of practical applications of economic theories during the third term. Special attention, however, is given to the questions which are vital issues of the

day, such as Finance and the Tariff. The utmost care is taken to avoid the teaching of party politics under the guise of Economic Science. At the same time the teaching in this Department recognizes the importance of inculcating honest views on the money question and the right of American citizens to know what can be said for the American policy of Protection both in the abstract and in its actual workings. Second and third terms, Senior year. Two periods per week.

MATHEMATICS.

Professors Hardy, Hall and Marquard, and Messrs. Smith, Hatch, Preston and Cawley.

It is strongly recommended that algebra be thoroughly reviewed just before admission to college.

401. ALGEBRA.—Binominal theorem, theory of logarithms, probability, variables and limits, series and theory of equations. Text-book—Wentworth's College Algebra. First term, Freshman year. Four periods per week.
402. ALGEBRA.—Preparation: Entrance Mathematics B. Through Ratio, Proportion and Variation. First term, Freshman year. Two periods per week.
403. ALGEBRA COMPLETED.—Preparation: 402. (Continuation of 402.) Second term, Freshman year. Four periods per week.
404. ALGEBRA.—To Progressions. Second term, Freshman year. Four periods per week.
405. ALGEBRA COMPLETED.—(Continuation of 404.) Third term, Freshman year. Four periods per week.
406. GEOMETRY.—Solid Geometry. First term, Freshman year. Two periods per week.
407. GEOMETRY.—Solid Geometry. First term, Freshman year. Four periods per week.
411. TRIGONOMETRY.—The work in this course begins with a rapid review of the elementary Plane Trigonometry. Then follows the advanced Plane Trigonometry, consisting of derivation of formulas and trigonometrical series, solution of

right- and oblique-angled triangles and solution of problems involving the practical applications. About one-third of the term is devoted to Solid Trigonometry which is also completed. Text-book—Hall and Funk's Trigonometry. Second term, Freshman year. Five periods per week.

412. TRIGONOMETRY.—Preparation: 403, 406. Third term, Freshman year. Four periods per week.
413. TRIGONOMETRY.—Preparation: 405-406. First term, Sophomore year. Four periods per week.
416. ANALYTICAL GEOMETRY.—The work in this subject consists of the Analytical Geometry of two dimensions, including the point, right line and circle; the conics, tangents, diameters, transformation of coördinates, the general equation of the second degree and higher plane curves; also the Analytical Geometry of three dimensions, including the point, the plane and surfaces of revolution. Text-book—Ashton's Analytic Geometry. Third term, Freshman year. Four periods per week.
417. ANALYTICAL GEOMETRY (Continued).—First term, Sophomore year. Two periods per week.
418. ANALYTICAL GEOMETRY.—Preparation: 412. Drawing of curves from their equations; accurate demonstrations of propositions. First term, Sophomore year. Four periods per week.
419. ANALYTICAL GEOMETRY.—Preparation: 418. (Continuation of 418.) Four periods per week. Second term, Sophomore year. Four periods per week.
420. ANALYTICAL GEOMETRY.—Preparation: 413. Same as 418. Second term, Sophomore year. Four periods per week.
421. MENSURATION.—The work includes the mensuration of the ordinary geometrical magnitudes, conic sections and curved surfaces and solids. The prismoidal formula, Simpson's rule, etc., are given. Text-book—Hall's Mensuration. Third term, Freshman year. One period per week.
426. DIFFERENTIAL AND INTEGRAL CALCULUS.—The work in the

Differential Calculus consists of the differentiation of all the functions of one or more variables, successive differentiation, implicit functions, development of function, evaluation of indeterminate forms, maxima and minima, properties of curves and radius of curvature, together with numerous practical applications in Mechanics. In the Integral Calculus are treated the integration of rational, irrational and transcendental functions, integration by parts and successive integration, rectification of curves, quadrature of plane surfaces, surfaces and volumes of solids, centers of gravity of lines, surfaces and solids, and moments of inertia. Text-book—Hall's Differential and Integral Calculus. First term, Sophomore year. Three periods per week.

427. DIFFERENTIAL AND INTEGRAL CALCULUS (Continued).—Second term, Sophomore year. Five periods per week.

429. DIFFERENTIAL CALCULUS.—Preparation: 419-420. Elective. First term, Junior year. Four periods per week.

430. INTEGRAL CALCULUS.—Preparation: 429. Elective. Second term, Junior year. Four periods per week.

431. CALCULUS.—Preparation: 430. Application of the Calculus to the study of Loci. Elective. Third term, Junior year. Four periods per week.

432. DIFFERENTIAL EQUATIONS.—Preparation: 431. Elective. First term, Senior year. Two periods per week.

433-44. THEORY OF FUNCTIONS.—Preparation: 432. Elective. Second and third terms, Senior year. Two periods per week.

436. LEAST SQUARES.—Law of probability of error, adjustment of observations, precision of observations and empirical formulas. The problems are selected with particular attention to the needs of engineers. Text-book—Merriman's Least Squares. Third term, Sophomore year. Two periods per week, for half term.

437. DIFFERENTIAL EQUATIONS.—In this subject are given the principal differential equations of the first order and degree

and those of the second order that are of importance in the applied mathematics that follow. Text-book, Hall's *Differential and Integral Calculus*. Third term, Sophomore year. Two periods per week.

DRAWING AND DESCRIPTIVE GEOMETRY.

Professor Graves and Mr. Doub.

- 441a. DRAWING.—Use of drawing instruments and materials; elementary plates of such a nature as to give the student ability in performing the simpler operations of drawing. Text-book, Reid's *Mechanical Drawing*. First term, Freshman year. Two 2-hour exercises per week.
- 441b. DRAWING.—Pen and brush shading, engineering conventions; structures in wood, railroad trestles, etc. Second term, Freshman year. Two 2-hour exercises per week.
- 441c. DRAWING AND PROJECTIONS.—Plates in structural steel, as built up columns, girder connections, etc., and tracings of same. Orthographic projections of points and lines; projections of various solids, and the obtaining of sectional views. Text-book, Reid's *Mechanical Drawing and Lectures*. Third term, Freshman year. Two periods per week.
- 442a. LETTERING.—Analytical study of, and practice in, making letters suitable for general use in drafting. Text-book, Reinhardt's *Free-hand Lettering*. First term, Freshman year. Two 1-hour exercises per week.
- 442b. LETTERING.—The lettering of connected sentences to acquire facility in spacing, etc.; lettering suitable for titles. Reinhardt's *Free-hand Lettering*. Second term, Freshman year. Two 1-hour exercises per week.
- 451a. DESCRIPTIVE GEOMETRY.—Problems on the point, line, and plane, with practical applications. Text-book, Hall's *Descriptive Geometry*. First term, Sophomore year. Two recitations and 1 hour of drawing per week.
- 451b. DESCRIPTIVE GEOMETRY.—Surface of single and double curvature; intersections and developments; planes tangent to solids; practical applications. Text-book, Hall's *Descriptive*

Geometry. Second term, Sophomore year. Two recitations and 1 hour of drawing per week.

- 451c. **DESCRIPTIVE GEOMETRY.**—The applications of the principles of Descriptive Geometry to isometric drawing; shades and shadows; the shadows of isometric drawings; perspective drawing and shadows. Lectures, recitations, and drawings. Third term, Sophomore year. Two recitations and 1 hour of drawing per week.
452. **MACHINE DRAWING.**—Neat, free-hand sketches of actual pieces of machinery such as pulleys, gears, shaft hangers, pistons, valves, eccentrics, etc. From these sketches, drawings and tracings are made; the elements of machine design. The object of this course is to enable the student to satisfactorily perform the duties of a mechanical draftsman. Third term, Sophomore year. Two 2-hour exercises per week.

PHYSICS.

Professor Gordon, Messrs. Koerber and Faulconer.

Courses 461-463 constitute the work in Physics required of all students. Technical students take these courses during the Sophomore year and others the third term of Sophomore and the first two terms of Junior year.

461. **MECHANICS AND HEAT.**—Experimental lectures, recitations and laboratory work. First term, Sophomore or Junior year. Four periods per week.
462. **ELECTRICITY AND MAGNETISM.**—Experimental lectures, recitations and laboratory work. Second term, Sophomore or Junior years. Four periods per week.
463. **SOUND AND LIGHT.**—Experimental lectures, recitations and laboratory work. Third term, Sophomore or Junior years. Four periods per week.
464. **PHYSICAL MEASUREMENTS.**—Recitations and laboratory work. Advanced experiments in Mechanics and Heat. First term. Two periods per week. Elective. Required for Electrical Engineering students.

465. ELECTRICAL MEASUREMENTS.—Recitations and laboratory work. The Wheatstone Bridge, Carey Foster Bridge, Murray and Varley Loops, High and Low Resistance, Temperature Coefficients of Resistance, and other experiments. Second term. Two periods per week. Elective. Required for Electrical Engineering students.
466. ELECTRICAL MEASUREMENTS.—Recitations and laboratory work. The magnetic properties of iron, capacity, inductance, calibration of voltmeters and ammeters, comparison of electromotive forces. Third term. Two periods per week. Elective. Required for Electrical Engineering students.
467. ADVANCED ELECTRICITY.—Lectures recitations, and laboratory work. The conduction of electricity through gases and radioactivity. First term, Senior year. Two periods per week. Elective.
468. ADVANCED ELECTRICITY.—Portions of Electrostatics, electric waves and the relations between electricity and light. Third term, Senior year. Two periods per week. Elective.
469. ELECTROCHEMISTRY.—Lectures, recitations and laboratory work. Conductivity of solutions, velocity of ions, standard cells, concentration cells, polarization, the thermodynamic and osmotic theory of cells. Third term, Junior or Senior year. Two periods per week. Elective.
470. OPTICS.—Lectures, recitations and laboratory work. The spectrometer, gratings, Fresnel's mirrors and prism, the interferometer, and the polarimeter. Two periods per week. Second term, Senior year. Elective.

MINERALOGY AND GEOLOGY.

Professor Peck and Mr. Fretz.

The course in Geology is continuous and each term's work depends upon that which has preceded. It is desirable that students electing this subject should do so for at least two terms and that they should be familiar with the elements of Physics, Chemistry and Biology.

For the work of the Senior year, a knowledge of these subjects is required.

491. DYNAMICAL, STRUCTURAL AND PHYSIOGRAPHICAL GEOLOGY.—Text-book and illustrated lectures. Elective. First term Junior year. Two periods per week.
492. HISTORICAL GEOLOGY.—Preparation: 491. Stratigraphic sequence of rocks, and fossil forms. Elective. Second term, Junior year. Two periods per week.
493. CRYSTALLOGRAPHY.—Preparation: 492. Crystal forms, properties of crystalline substances, drawing and measurements of crystals. Elective. Third term, Junior year. Two periods per week.
494. PRACTICAL FIELD GEOLOGY.—Preparation: 493. Elective. First term, Senior year. Two periods per week.
495. ADVANCED CRYSTALLOGRAPHY AND ELEMENTARY PETROGRAPHY.—Preparation: 494. Elective. Second term, Senior year. Two periods per week.
496. FIELD GEOLOGY.—Preparation: 495. Elective. Third term, Senior year. Two periods per week.
511. CRYSTALLOGRAPHY.—This course is illustrated with glass and wooden models, and each alternate exercise consists of a practicum at which well-crystallized minerals are studied, and their properties discussed. The latter part of the term is devoted to a brief discussion of the optics of crystals. Text-book—Williams' Elements of Crystallography. First term, Junior year. Two periods per week.
512. PETROGRAPHY.—A large collection of hand specimens of rocks with thin sections are used in this study. Text-book—Kemp's Handbook of Rocks. Second term, Junior year. Two periods per week.
513. MINERALOGY.—A systematic review of mineral species, more special attention being paid to their chemical and crystallographic relations and to their mode of occurrence in nature. Instruction is given by lectures which are illustrated by a study collection consisting of some two thousand specimens,

including the most important species. A course in determinative mineralogy supplements these lectures. The student is required to determine sixty minerals and to write out a description of each. Third term, Junior year. Three periods per week.

516. GENERAL GEOLOGY.—Dynamical, Structural and Physio-graphical Geology. The work of the class-room is supplemented by excursions into the neighboring region, and sufficient time is devoted to field work to enable each student to construct a six-inch section up and down the Delaware River at Easton. Text-book—Scott's Introduction of Geology. First term, Senior year. Two periods per week.

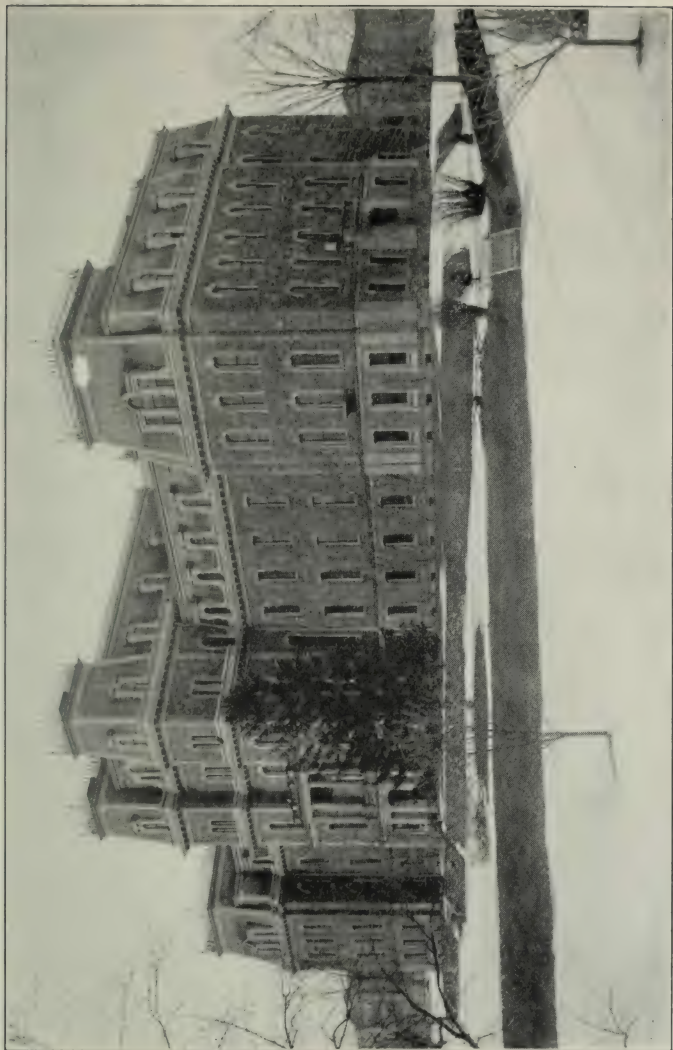
517. GENERAL GEOLOGY.—Continuation of Course 516. Historical Geology. Accumulations, organic and inorganic, which are of economic importance. Text-book—Scott's Introduction to Geology. Second term, Senior year. Two periods per week.

521. MINING GEOLOGY. ECONOMIC GEOLOGY.—Practical geology of the metalliferous deposits. This is a lecture course, but reading is assigned in the following works: "Economic Geology of the United States," Ries; "Ore Deposits of the United States and Canada," Kemp; "The Nature of Ore Deposits," Beck; etc. Second term, Senior year. Two periods per week.

522. MINING GEOLOGY. FIELD GEOLOGY.—In this course the student makes a detailed study of an area, from which he constructs a colored geological map and geological sections. Specimens of the different ores are collected and then sections are cut for microscopical examination. Third term, Senior year. Two periods per week.

523. MINING GEOLOGY.—Elective. First term, Senior year. Two periods per week.

524. MINING GEOLOGY.—Elective. Second term, Senior year. Two periods per week.



PARDEE HALL.

ASTRONOMY.

Professor Hardy and Mr. Cawley.

531. DESCRIPTIVE ASTRONOMY.—Fundamental definitions of the celestial sphere, parallax, refraction, the earth as an astronomical body, the sun, the moon eclipses and the planets. Text-book—Young's Astronomy. First term, Senior year. Two periods per week.

536. DESCRIPTIVE ASTRONOMY.—More detailed course than 531. First term, Senior year. Four periods per week.

541-42. PRACTICAL ASTRONOMY.—The use of the sextant in determining time by a single altitude of the sun, by a single altitude of a star, by equal altitudes of the sun, by equal altitudes of a star; in determining latitude by the meridian altitude of a star in any position, by circummeridian altitudes and in determining longitude by lunar distances. The instrumental constants of the transit instrument and its use in determining longitude. The use of the zenith telescope in determining latitude. The sections of the class are made so small that each student gets considerable practice with the instruments. Second and third terms, Senior year. Two periods per week.

BIOLOGY.

Professor Davison and Mr. Foster.

The work of this Department occupies all of the ten rooms in Jenks Biological Hall. A general laboratory, forty by sixty feet, and four special laboratories well equipped with modern apparatus, in addition to an herbarium and vivarium provide ample facilities for pursuing practical studies on plant and animal life.

The courses in Biology, excepting Sanitary Biology required for the Civil Engineers and Chemists, are elective only, and consist of work throughout the Junior and Senior years. They are open for election to Classical, Latin Scientific, and General Scientific students. In

order to meet the double purpose of a professional preparation and general culture, the courses are so arranged as to provide in each the special knowledge required without sacrificing the ends of general culture and discipline which is sought in all the undergraduate courses. Those not wishing to take the complete course, and yet desiring to know the meaning of the life forms, the relation of plants and animals to one another and especially to man, and to understand the factors and methods of evolution, should pursue the work of the last two terms of the Junior year and the first term of the Senior year. One may, however, begin his biological studies at any time prior to the second term of the Senior year. The work of the second and third terms of the Senior year is designed for those expecting to enter the professions of teaching or medicine.

551. MAMMALIAN ANATOMY.—This enables the student to secure a definite idea of the structure of his own body, to understand some of the evidences of evolution of animals and realize the unity of structure of the animal kingdom. A discussion of parts of the cat or dog together with studies and demonstrations on certain dissected mammals with special reference to the nervous system makes an excellent preparation for the study of Psychology and Physiology. Elective. First term, Junior year. Two periods per week.

552. VERTEBRATE ZOOLOGY.—The laboratory work involves a study of one or more types representing each of the five classes of vertebrates. The evolution of the various organs and systems and the origin and development of certain forms of animals together with their habits and natural history furnish fertile topics for recitations and lectures. This course, in connection with General Biology, Course 553, gives the student a general survey of the entire animal kingdom. Elective. Second term, Junior year. Four periods per week.

553. GENERAL BIOLOGY.—The morphology and life history of a few types of the invertebrates are studied with a view to understanding the processes of life and the relation of one form of life to another. Darwinism and the allied problems struggle for existence, parasitism, etc., are discussed, and considerable attention is given to the interdependence of animals and plants, and insects and birds. A well-equipped laboratory with microscopes, aquaria and terraria, offering access to numerous specimens living and preserved, furnishes every advantage to those pursuing this course. Elective. Third term, Junior year. Four periods per week.
554. BACTERIOLOGY AND HEALTH.—Preparation: 551, 553 or 571. This work occupies four periods per week during the first term of the Senior year. A considerable amount of laboratory work, supplemented by investigations in a well-equipped library, and by lectures and demonstrations, is applied to a study of the form, habits and use of bacteria, their relation to agriculture, to industrial processes and to disease. Incubators, water-baths, sand and domestic filters, and microscopes equipped with oil immersion lenses enable the students to make a practical study of the cause and prevention of disease, including disinfection, disposal of sewage, sanitary analysis of water and milk. The necessity and method of ventilation and natural and artificial immunity are treated in the light of the twentieth century knowledge. Elective. First term, Senior year. Four periods per week.
555. PHYSIOLOGY.—Preparation: 551, 553 or 554. The laboratory work consists of the performance of certain experiments and a microscopic study of the chief organs in man. The recitations and lectures are devoted chiefly to the physiological problems relating to the digestive, vascular, respiratory, excretory and nervous systems. Elective. Second term, Senior year. Four periods per week.
556. EMBRYOLOGY AND HISTOLOGY.—Preparation: 551 or 552 and 555. The maturation and fertilization of the egg of *Ascaris*, the segmentation of the egg and the formation of the germinal layers in fish and amphibians, and the origin and early development of the chief organs in chick embryos, and

the derivation and function of the fetal membranes in birds and mammals constitute the laboratory work. Discussion of these subjects, together with certain questions in cytology, such as the nature of the germ plasm, germinal selection, and heredity, occupy the hours of recitation. A brief study of the chief tissues of some mammal is also made. Each student is required to fix, harden, embed, section, stain and mount material for microscopic work. Twenty compound microscopes, each equipped with three objectives, triple nose piece, and full substage apparatus, in addition to automatic and sliding microtomes, water-baths, incubators, etc., offer excellent opportunities to those preparing for medicine or special biological work. Either Course II or III, and Course VI are required as a preparation for this course. Elective. Third term, Senior year. Four periods per week.

561. **SANITARY BIOLOGY.**—The cause and prevention of disease, the rôle of bacteria in the septic tank; the effect of polluted water on health; biological analysis of water. The Biological Laboratory is used by students in this course prior to their work in Water Supply and Sewerage. It contains equipment fitted for the study of Sanitary Biology, *viz.*, twenty compound microscopes, a dozen aquaria, several sets of Sedgwick-Rafter apparatus, modern sand and house filters, drying ovens, sterilizers, incubators, fermentation tubes, petri dishes, etc., furnishing the necessary facilities for a practical study of the algae, aquatic animals and bacteria relating to sewage disposal and water supply. Required for Civil Engineers and Chemists. Elective for others. Third term, Junior year. Two periods per week.

571. **BOTANY.**—The time is largely devoted to the study of the morphology and life history of the lower plants from bacteria to ferns and an explanation of the physiological processes in plants. The relation of insects to plants and plants to man, together with the problem of breeding new varieties, are some of the practical topics considered. Excellent advantages for pursuing this branch are offered by the well-equipped laboratory and extensive College Herbarium containing representatives of nearly all the mosses, ferns and

flowering plants in Pennsylvania in addition to hundreds of species from other regions of North America. Elective. First term, Junior year. Two periods per week.

HYGIENE AND PHYSICAL CULTURE.

Professor Davison and Mr. Bruce.

580. Lectures on Health and the general principles of Physiology and Anatomy illustrated by diagrams. First term, Freshman year. One period per week.

581. PHYSICAL CULTURE.—The work of this department is carried on in the gymnasium, and physical training is required of all students of the Freshman and Sophomore Classes, four periods per week.

The course in physical training embraces educational gymnastics, systematic bodily exercises based on scientific principles and founded on physiological rules.

The student before entering on the course must present himself to the Director for a physical examination. By means of this examination the physical condition of the individual is ascertained. The relative proportions of the parts of the body; the undue development of some muscles and the relaxed and enfeebled condition of others; the comparative size of body and limbs; variations of height, breadth, weight, and muscular strength from the normal standard of a given age are all taken into account in prescribing the course of training. The results of this examination are plotted on anthropometric charts and directions given in booklet form for developing the various parts of the body and correcting individual defects. At the end of the course a second examination is made and the results plotted on the same chart, thus showing the student his exact physical improvement.

Optional courses are offered to upper-classmen in advanced gymnastics and instruction in the science of fencing and of wrestling.

Outdoor exercise is encouraged and cross-country running in a mild form is promoted for the benefit of students who are not members of athletic teams.

At the end of each year, a silver loving cup will be presented by the Director to the student making the greatest improvement in strength, measurements and general gymnas-

tic efficiency, as indicated by the physical examination and the regular class work. All students taking the required work in the gymnasium will be considered as competitors for the cup.

CIVIL ENGINEERING.

Professors Porter and Lyle and Messrs. Thoroughgood, Merrill and Anderson.

601. SURVEYING.—Chain, compass and transit surveying. Leveling. Drafting. Text-book—Breed and Hosmer's Plane Surveying. Third term, Freshman year. Two periods per week.
602. SUMMER SCHOOL.—Field problems in use of chain, level and transit. Survey of College Campus. Map. Area Computations. Three weeks in vacation at end of Freshman year.
603. SURVEYING.—Stadia survey. Theory of trigonometric and barometric leveling. Plane-table, sextant and hydrographic surveying. Topographic drafting. Text-book—Breed and Hosmer's Higher Surveying. First term, Sophomore year. Two periods per week.
604. HIGHER SURVEYING.—Plane table, sextant and aneroid. Precise leveling, base line measurements, and solar observations for azimuth and latitude. Text-book—Breed and Hosmer's Higher Surveying. Third term, Junior year. Two periods per week.
611. RAILROADS.—Simple, reverse, compound, vertical and transition curves. Drafting. Text-book—Allen's Railroad Curves and Earthwork. Second term, Sophomore year. Two periods per week.
612. RAILROADS.—Turnouts, cross-overs. Paper location of railroad. Estimate of cost. Drafting. Field problems. Text-book—Allen's Railroad Curves and Earthwork. Third term, Sophomore year. Two periods per week.
613. SUMMER SCHOOL.—Railroad reconnaissance. Preliminary and final location. Cross-sectioning. Map. Three weeks in vacation at end of Sophomore year.

614. RAILROADS.—Computation of earthwork from notes of Summer School Survey. Problems in Earthwork. Mass diagrams. Drafting. Text-book—Allen's Railroad Curves and Earthwork. First term, Junior year. Three periods per week.
615. RAILROADS.—Economic location. Traffic. Operating expenses. Cars and locomotives. Railroad structures. Text-book—Webb's Railroad Construction. Second term, Junior year. Two periods per week.
621. APPLIED MECHANICS. STATICS.—Principles of equilibrium and their application to flexible cords, tackle, jointed structures, friction, moment of inertia. KINEMATICS. Rectilinear motion, curvilinear motion, harmonic motion. Motion of a rigid body, translation, rotation, plane motion. Text-book—Maurer's Mechanics. Third term, Sophomore year. Four periods per week.
622. APPLIED MECHANICS. KINETICS.—Motion of a particle, translation of a rigid body, rotation, plane motion of a rigid body, work and energy, impulse and momentum. First term, Junior year. Four periods per week.
623. MECHANICS OF MATERIALS.—The principles of stress and strain; the behavior of materials under tension, compression and shearing; investigation and design of pipes, riveted joints, boilers and standpipes; strength and flexure of simple and cantilever beams. Report on the carrying capacity of a floor. Text-book—Merriman's Mechanics of Materials. First term, Junior year. Four periods per week.
624. MECHANICS OF MATERIALS.—Restrained and continuous beams; columns; shafts; reinforced concrete. Impact and fatigue; true and internal stresses; mathematical theory of elasticity. Design of an I-beam highway bridge and of a steel standpipe. Text-book—Merriman's Mechanics of Materials. Second term, Junior year. Four periods per week.
625. GENERAL TESTING LABORATORY.—Study and use of testing machines. Commercial tension tests of iron and steel. Modulus of elasticity in tension and compression. Shear tests of iron,

steel and wood. First term, Junior year. Two periods per week.

626. GENERAL TESTING LABORATORY.—Transverse tests of cast iron and wood; modulus of elasticity of steel in bending; tests of wooden columns; torsion tests of iron and steel; calibration of testing machines; modulus of elasticity of concrete; reinforced concrete beams. Second term, Junior year. Two periods per week.
631. ROADS AND PAVEMENTS.—Location, construction and maintenance of town and country roads, city streets and pavements. Street cleaning. Text-book—Frost's The Art of Road Making. Second term, Junior year. Two periods per week.
632. ROAD MATERIAL LABORATORY.—Standard tests of paving brick; road metal; and petroleum, malts, tars and asphalts. Second term, Junior year. One period per week.
641. MASONRY.—The requisites of stone, brick and cement; the different kinds of bonds; strength of stone, brick and concrete masonry; the construction of foundations, bridge piers, abutments, retaining walls, dams, culverts and arches. Text-book—Baker's Masonry. Third term, Junior year. Two periods per week.
642. MASONRY DESIGN.—Design of a dam, a bridge pier and an arch, using both graphical and numerical processes. Notes. First term, Senior year. Two periods per week.
651. CEMENT.—The study of raw materials; method of manufacture; meaning and interpretation of different physical tests; the sources of error in testing; the inspection and sampling of both Portland and Natural Cements. Visits to cement mills and sampling and testing of a shipment of cement. Text-book—Taylor's Practical Cement Testing. First term, Junior year. Two periods per week.
652. CONCRETE, PLAIN.—Materials for concrete; proportioning and mixing; strength of plain concrete in compression, tension and flexure; the expansion and contraction of concrete; fire resistance of concrete; action of salt water on concrete as a protection to metal; adhesion of concrete to steel and iron;

a short discussion of the different systems of reinforcing. Second term, Junior year. Two periods per week.

653. CONCRETE, REINFORCED.—Properties of the materials, general theory, relation of stress intensities on concrete and steel. Varieties of flexure formulas. Shearing stresses, bond stresses, working stresses and construction details. The preparation and use of diagrams and tables. The complete design of a reinforced concrete floor. Text-book—Turneure and Maurer's Reinforced Concrete. Third term, Junior year. Two periods per week.
654. CEMENT LABORATORY.—Tests of Portland and Natural Cements are made in accordance with standard methods and specifications, the aim being to have the student become thoroughly acquainted with each standard test and understand and appreciate the significance of the results obtained. Special tests are made to show the effect of varying from standard methods. First term, Junior year. Two periods per week.
655. CONCRETE LABORATORY.—Mechanical analysis of the materials for concrete; proportioning and mixing; preparation of concrete specimens for future tests. Second term, Junior year. Two periods per week.
656. REINFORCED CONCRETE LABORATORY.—Tests on plain concrete specimens to determine the stress deformation curve in tension and compression. Modulus of elasticity. Tests on reinforced beams to determine deflection and fiber stress distribution, location of neutral axis, and comparison of actual results with those given by various formulas. Third term, Junior year. Two periods per week.
661. HYDRAULICS.—Hydrostatics, hydraulic instruments, orifices, weirs and tubes. Text-book—Merriman's Hydraulics. Third term, Junior year. Three periods per week.
662. HYDRAULICS.—Pipes; conduits; rivers; water power; dynamics; overshot, undershot and breast wheels; impulse wheels; turbines. Text-book—Merriman's Hydraulics. First term, Senior year. Three periods per week.

663. **HYDRAULIC LABORATORY.**—Tests are made on the circular orifice, the Venturi meter, water meters and weirs. Third term, Junior year. One period per week.
664. **HYDRAULIC FIELD WORK.**—Measurements of the flow of a stream by use of the current meter. Notes. First term, Senior year. Two afternoons.
671. **SEWERAGE.**—The disposal of sewage and garbage. The determination of the size and capacity of sewers, inlets and flush tanks. Construction methods. Text-book—Folwell's Sewerage. First term, Senior year. Two periods per week.
672. **SEWERAGE DESIGN.**—Design of a sewer system for a small city with map and profiles. Notes. Second term, Senior year. Two periods per week.
681. **WATER SUPPLY.**—The requisites for a good water; the available sources of supply; the construction of pumping plants, reservoirs and pipe lines; purification of water and its distribution to the public. Text-book—Turneaure and Russell's Public Water Supplies. Second term, Senior year. Two periods per week.
682. **WATER SUPPLY DESIGN.**—Design of a water supply system for a small city. Notes. Third term, Senior year. Two periods per week.
683. **PARK ENGINEERING.**—Lectures on the engineering work involved in park and parkway development. Preliminary surveys; the acquisition of lands; topographical surveys for the use of the landscape architect; the letting of contracts; the preliminary operations of the contractor; drainage and sewerage; grading by hand, excavator, dredge and steam-shovel; pile driving; masonry walls and steps; water-supply systems; paths and drives; lighting. Second term, Senior year. One period per week.
690. **FRAMED STRUCTURES.**—The theory and computation of stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Notes. Third term, Junior year. Two periods per week.
691. **ROOFS AND BRIDGES.**—The theory and computation of

stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Railroad bridges under locomotive wheel, excess and equivalent loads. Stress sheets. Notes. First term, Senior year. Two periods per week.

692. ROOFS AND BRIDGES.—The theory and computation of stresses in continuous, partially continuous, draw and cantilever trusses. Notes. Second term, Senior year. Six periods per week.
693. ROOFS AND BRIDGES.—The theory and computation of stresses in suspension bridges and three-hinged arches. Notes. Third term, Senior year. Five periods per week.
694. ROOF DESIGN.—Complete computations and design drawing for a wooden roof truss with bill of materials and cost sheet. Notes. First term, Senior year. One period per week.
695. BRIDGE DESIGN.—Complete computations and design drawing of a plate girder for railroad purposes, in accordance with standard specifications. Bill of materials, weights and estimate of cost. Notes. Second term, Senior year. Two periods per week.
696. BRIDGE DESIGN.—Complete computations and design drawing of a through pin-connected railroad bridge in accordance with standard specifications. Bill of materials, weights and estimate of cost. Notes. Third term, Senior year. Five periods per week.
697. BRIDGE ERECTION.—Designing of false work. Erection of a full-weight pin-connected truss bridge. Third term, Senior year. Two days.
698. GRAPHIC STATICS.—Analysis of stresses by the force and equilibrium polygon to the discussion of beams and girders. Analysis of stresses in roof and bridge trusses. Notes. First term, Senior year. One period per week.
699. THESIS.—A thesis is required of every student as a condition of graduation, upon a subject appropriate to and ap-

proved by the Department. All laboratories and other apparatus belonging to the Department may be used for thesis purposes. Third term, Senior year. Two periods per week.

MINING ENGINEERING.

Professor Marquard and Mr. Hatch.

701. MINE SURVEYING. Instruments. Stations. Underground traversing. Method of connecting surface and underground surveys. Use of top, side and solar telescopes. Mapping. Mineral land claims. Problems. First term, Junior year. Two periods per week.
711. PROSPECTING.—Physical characteristics of deposits. Geological indications. Prospecting for placer, vein and bedded deposits. Preliminary workings. Sampling. Examination. Valuation. Location of mineral claims. Second term, Junior year. Two periods per week.
712. DEEP BORING.—Use and location of bore holes. Rod boring. American system of cable drilling. Diamond drilling. Davis-Calyx, Matther-Platt, and Kind's systems of drilling. Survey of bore holes. Shaft sinking by boring. Third term, Junior year. One period per week.
713. BLASTING AND QUARRYING.—Explosives. Black powder, nitroglycerine, and its compounds; other high explosives and their use. Tools for boring blast holes, and the amount of charge. Firing by squib, and electricity. Slate, cement and stone quarrying. Third term, Junior year. Two periods per week.
714. SHAFT SINKING, DRIFTING, TUNNELING.—Shaft excavation and timbering. Location. Alignment. Level stations in the shaft. Special sinking methods; piling drums, freezing process, Trigger's method, Kind-Cauldron system, Lippman's system. Tunneling methods in hard and soft rock. Systems of tunneling. First term, Senior year. Two periods per week.
715. EXPLOITATION.—Open cut work. Hydraulic mining. Gold dredging. Coal mining methods. Stopping methods. Slicing, caving, filling, block caving, room and pillar methods of min-

ing ore. Methods of mine development. Maps to illustrate. Salt mining. First term, Senior year. Two periods per week.

716. TRANSPORTATION.—Arrangements for loading and unloading cars and bins on surface and underground. Underground haulage: animal, electric, rope, steam, and air. Self-acting planes. Hoisting drums, brakes, motors, ropes, guides. Safety appliances. Signals. Second term, Senior year. Two periods per week.

717. VENTILATION AND LIGHTING.—Air in mines. Mine gases. Testing air. Natural, furnace ventilation. Positive blowers. Centrifugal fans. Theory and efficiency of fans. Measurement and control of air currents. Resistance of air ways. Explosions. Laws. Method of lighting. Safety lamps, electric lights. Laws. Second term, Senior year. Two periods per week.

718. MINE DRAINAGE.—Source and action of mine waters. Mine pumps. Water column pipes. Dams. Hoisting buckets. Drainage tunnels. Siphons. Operation of pumps by electricity and compressed air. Theory and efficiency of centrifugal pumps. Third term, Senior year. Three periods per week.

719. MINE CONSTRUCTION.—Study of stresses in beams, columns and girders by graphic statics. Design of a mine gangway set. Shaft timbering. Square set timbering methods. Design of flumes and trestles. First term, Senior year. Two periods per week.

720. MINE CONSTRUCTION.—Masonry, foundations, retaining walls. Stresses in trusses by graphic statics. Design of a roof truss. Second term, Senior year. Two periods per week.

721. MINE CONSTRUCTION.—Design of ore bins, headframe, tipples, and mill buildings. Third term, Senior year. Two periods per week.

731. ORE DRESSING.—Hand picking. Principle of crushing, and concentration. Crushers: jaw and gyratory, rolls, stamps, Huntington mill, Chilean mill, arastras. Classifying ma-

- chinery: trommels, grizzlies, shaking screens, hydraulic classifiers, settling ponds, spitzkastens. Concentrating machinery: jigs with theory of jigging, vanners, tables, magnetic concentrators, amalgamation. Third term, Senior year. Four periods per week.
741. MINE MACHINERY.—Coal cutters, drills, hoists, cableways, motors, blast firers, air compressors. Theory of air compression and method of using and conducting compressed air. Third term, Senior year. Two periods per week.
751. MINE ADMINISTRATION.—Organization, administration and management. Mine accounts and cost keeping. Third term, Senior year. Two periods per week.
752. MINING LAW.—Review of the mining laws of the various countries. General principles of real estate law with respect to minerals. United States mining laws. State laws and local regulations. Third term, Senior year. Two periods per week.
761. THESIS.—A graduating thesis is required of each candidate for a degree. This thesis must be an original design or review of some process, machinery or plant related to mining operations. The subject of the thesis is assigned by the department along lines of special interest to the student.

ELECTRICAL ENGINEERING.

Professor Rood, Mr. Perry.

804. ELEMENTS OF ELECTRICAL ENGINEERING.—A special course designed for students in Civil, Mechanical and Mining Engineering. Elective for General Scientific and Latin Scientific students. Electricity and magnetism; electrical measurements; electrical illuminants; lighting systems; dynamos; motors; alternating current machinery; transformers. First term, Junior year. Four periods per week.
806. ELECTRICAL PROBLEMS.—Solution of elementary problems relating to direct current engineering. First term, Junior year. Two periods per week.
807. ELECTRICAL PROBLEMS.—A continuation of 806. Solution of

problems relating to more advanced direct current engineering and to elementary alternating current engineering. Second term, Junior year. Two periods per week.

811. ALTERNATING CURRENTS.—Fundamental principles governing circuits having a variable E. M. F.; effect of resistance, inductance and capacity; generalized Ohm's law. First term, Junior year. Three periods per week.

812. ALTERNATING CURRENTS.—A continuation of 811. Alternator regulation; single, two- and three-phase circuits; measurement of power in polyphase circuits; theory of the transformer, single and polyphase transformers; methods of phase transformation. Second term, Junior year. Three periods per week.

814. ALTERNATING CURRENT CIRCUITS.—An advanced consideration of alternating current circuits; Fourier's series and its application to A. C. circuits; wave form; wave and vector discussion and analysis; application and use of the complex notation. First term, Senior year. Four periods per week.

821. ELECTRICAL LABORATORY.—Introduction to Laboratory methods and practice; measurement of resistances by drop method; insulation test; magnetic leakage; fuses; voltmeter and ammeter calibration by various methods; recording meters. First term, Junior year. Two periods per week, reports.

822. ELECTRICAL LABORATORY.—A continuation of 821. Tests upon arc and incandescent lamps; photometry; magnetization and characteristic curves of dynamos; tests of armature reactions. Second term, Junior year. Two periods per week, reports.

823. ELECTRICAL LABORATORY.—A continuation of 822. Parallel running of generators; investigation of commutator losses; elementary tests with alternating currents; effects of inductance and capacity. Third term, Junior year. Two periods per week, reports.

824. ELECTRICAL LABORATORY.—Motor and dynamo characteristics, A. C. wave form; magnetization and characteristic

curves of alternating current generators; efficiency and regulation tests of transformers. First term, Senior year. Two periods per week, reports.

825. ELECTRICAL LABORATORY.—A continuation of 824. Tests of induction and synchronous motors; transformer groupings and resultant ratios; phase transformation; power transmission; transmission losses and efficiencies. Second term. Senior year. Two periods per week, reports.
826. ELECTRICAL LABORATORY.—A continuation of 825. Motor-generator tests; investigation of the rotary converter and its losses and characteristics; dielectric strength of insulating materials; resonance; the oscillograph. Third term, Senior year. Two periods per week, reports.
827. ELECTRICAL LABORATORY.—A special laboratory course designed for student in Civil, Mechanical and Mining Engineering. Elective for General Scientific and Latin Scientific students. Fundamental experiments in calibrations, photometry, direct current generator characteristics. Second term, Junior year. Two periods per week.
828. ELECTRICAL LABORATORY.—A continuation of 827. Motor characteristics, motor and dynamo efficiencies, alternating current motor and transformer tests. Third term, Junior year. Two periods per week.
831. ENGINEERING ABSTRACTS.—The review and discussion of articles and papers of value in current engineering literature. Throughout Junior and Senior years. One period per week.
841. ELECTRICAL DESIGN.—The design and calculation of rheostats, controllers, wiring systems and machines. First term, Senior year. Two periods per week.
842. ELECTRICAL DESIGN.—A continuation of 851. Design and calculation of advanced types of electrical machinery, generators, motors and transformers. Second term, Senior year. Two periods per week.
851. ILLUMINATING ENGINEERING.—A review and close study of the modern type of illuminants, gas and electric; photometry and standards of light; candle power distribution; effective

illumination; reflectors, shades and globes, their effects and losses; location of lights; wall reflection and absorption. Third term, Junior year. Four periods per week.

852. MOTOR ENGINEERING.—A detailed consideration and comparison of the various types of constant and multi-speed direct and alternating current motors, their control, proper fields of use; types and methods of machine drives; power requirements of various commercial processes. Third term, Junior year. Four periods per week.

853. ELECTRIC RAILROADS.—Systems of distribution; rail-bonds and bond testing; electrolysis; direct current motors and controllers; single-phase commutator motors, train operation and control; speed-time curves. Third term, Senior year. Five periods per week.

861. ELECTRIC POWER TRANSMISSION.—Low potential direct and alternating current distributing systems; calculation of losses and drop; house and factory wiring and systems; fire hazards and their prevention; high potential lines, their construction and maintenance; lines and line losses. First term, Senior year. Four periods per week.

871. ELECTRIC POWER STATIONS.—A study of the considerations affecting the selection, erection and maintenance of steam and electric power plant machinery, and the assembling of such machinery to form an economical plant for the production of electric power and light. Second term, Senior year. Four periods per week.

872. HYDRO-ELECTRIC ENGINEERING.—The fundamental principles of hydroelectric engineering; types, and forms of powerhouses; the types, proper selection and erection of turbines and governors, generating, switching and transmission apparatus. Second term, Senior year. Five periods per week.

881. THE TELEPHONE.—A study of all the modern telephone systems with a review of the earlier systems and development. Third term, Senior year. Three periods per week.

891. THESIS.—A thesis is required of every student as a condition for graduation, the topic assigned or approved by

the head of the Department. The thesis must show the result of individual investigation and research.

CHEMISTRY AND METALLURGY.

Professors Hart and Wysor and Messrs. DeLong, Hess and Taylor.

901. ELEMENTARY DESCRIPTIVE INORGANIC CHEMISTRY.—Brief course in the chemistry of the non-metals and metals comprising lectures, preparatory work, and recitations. Third term, Sophomore year. Two periods per week.
- 902-3-4. QUALITATIVE ANALYSIS AND QUANTITATIVE ANALYSIS (Begun).—First, second and third terms, Junior or Senior year. Two periods per week.
- 905-6-7. QUANTITATIVE ANALYSIS.—Elective Course: The work of which is varied to meet the requirements of the student. First, second and third terms, Senior year. Two periods per week.
911. DESCRIPTIVE INORGANIC CHEMISTRY.—Lectures, quizzes and laboratory work. First term, Freshman year. Four periods per week.
912. ADVANCED INORGANIC CHEMISTRY.—The laws of gases. The chemical balance. Diffusion and dissociation. Principles of quantitative analysis. Recitations and laboratory work. Second term, Freshman year. Two periods per week.
913. QUALITATIVE ANALYSIS (Begun).—Third term, Freshman year. Four periods per week.
914. QUALITATIVE ANALYSIS (Continued).—First term, Sophomore year. Four periods per week.
915. QUALITATIVE ANALYSIS (Completed).—Second term, Sophomore year. Four periods per week.
916. QUANTITATIVE ANALYSIS (Begun).—Third term, Sophomore year. Four periods per week.
917. CHEMICAL ARITHMETIC.—Third term, Sophomore year. Four periods per week.

918. QUANTITATIVE ANALYSIS (Continued).—First term, Junior year. Five periods per week.
919. THEORETICAL CHEMISTRY including special determination in the laboratory.—First term, Junior year. Two periods per week.
920. ORGANIC CHEMISTRY (Begun).—First term, Junior year, Three periods per week.
921. ORGANIC CHEMISTRY (Continued).—Lectures, recitations and laboratory work. Second term, Junior year. Three periods per week.
922. ORGANIC CHEMISTRY (Completed).—Third term, Junior year. Four hours per week.
924. THEORETICAL CHEMISTRY (Continued).—Second term, Junior year. Two periods per week.
925. THEORETICAL CHEMISTRY (Completed).—Third term, Junior year. Two periods per week.
926. QUALITATIVE ANALYSIS (Begun) (Shorter Course).—Second term, Freshman year. Two periods per week.
927. QUALITATIVE ANALYSIS (Completed) (Shorter Course).—Third term, Freshman year. Two periods per week.
928. QUANTITATIVE ANALYSIS (Begun) (Shorter Course).—First term, Sophomore year. Two periods per week.
929. QUANTITATIVE ANALYSIS (Continued) (Shorter Course).—Second term, Sophomore year. Two periods per week.
930. QUANTITATIVE ANALYSIS (Completed) (Shorter Course).—Third term, Sophomore year. Two periods per week.
931. QUANTITATIVE ANALYSIS (Continued).—Second term, Junior year. Five periods per week.
932. QUANTITATIVE ANALYSIS (Continued).—Third term, Junior year. Four periods per week.
933. QUANTITATIVE ANALYSIS (Continued).—First term, Senior year. Ten periods per week.

934. CHEMICAL ENGINEERING.—The Elements of Chemical Engineering. First term, Senior year. Two periods per week.
935. CHEMICAL TECHNOLOGY.—Manufacture of "heavy chemicals." Second term, Senior year. Two periods per week.
951. METALLURGY.—Properties of Metals. Refractory materials and fluxes; furnaces; fuels and thermo measurements; ore dressing; iron and steel. First term, Junior year. Two periods per week.
952. METALLURGY.—Lectures, recitation and laboratory. Second term, Junior year. Two periods per week.
953. METALLURGICAL CHEMISTRY.—Elective. First term, Senior year. Two periods per week.
954. METALLURGICAL CHEMISTRY (Continued).—Elective. Second term, Senior year. Two periods per week.
955. ASSAYING.—Second term, Senior year. Two periods per week.
- 961-2-3. TECHNICAL GERMAN.—Translation of Chemical works from the German. First, second and third terms, Junior year. One period per week.
- 964-5-6. TECHNICAL GERMAN (Continued).—First, second and third terms, Senior year. One period per week.
971. THESIS WORK.—Second term, Senior year. Six periods per week.
972. THESIS WORK (Completed).—Third term, Senior year. Twelve periods per week.
973. AGRICULTURAL CHEMISTRY (optional).—Second term, Senior year. One period per week.
974. LEAD BURNING (optional).—Second term, Senior year. One period per week.

MECHANICAL ENGINEERING.

Professor Boynton and Mr. Rounds.

1001. WOODWORKING AND PATTERN MAKING.—Use and care of hand tools and woodworking machinery. The *Bench Work* (about five weeks) consists in the making of various joints used in mill construction and framing; *Woodturning* (about two weeks), the use of the lathe and turning chisels with exercises illustrating methods of holding different kinds of work;

Pattern Making (the rest of the term), the construction of patterns involving shrinkage, draft, fillets, finish, coreprints, coreboxes, etc. First term, Sophomore year. Two periods per week. Prerequisite 441 and 442.

1002. FOUNDRY.—The tempering of sand, and making of moulds from various types of patterns, and cores to go with them. At least one casting of lead to familiarize the student with the process, then pours of brass and iron. Instruction is also given in preparing, charging, and operating a cupola; and special methods such as sweep moulds, etc. Second term, Sophomore year (about four weeks). Two periods per week. Prerequisite 1001.

1003. FORGING.—Drawing, upsetting, welding, and forming of iron including the use of swedges, etc. Annealing, hardening, tempering of steels, and tool making. Second term, Sophomore year (about five weeks). Two periods per week. Prerequisite 1001.

1004. BENCH WORK.—The use of cold chisels and files for working to size and finishing; and hand scrapers for producing flat surfaces. Second term, Sophomore year (about two weeks). Two periods per week. Prerequisite 1003.

1005. MACHINE SHOP. LATHE WORK.—Outside and inside cuts, chuck, face plate, and arbor work, turning tapers, outside and inside threads. *Shaper, Planer and Milling Machine*—exercises showing the special uses of each, and different methods of doing similar work. *Drills, Taps, Etc.* In each case, instruction is given in regard to setting up and adjusting the machine; selecting and sharpening the tools; proper cuts, feeds, and speeds for different tool steels on different metals. Third term, Sophomore year. Two periods per week. Prerequisite 1001-2-3-4.

1006. GEAR CUTTING.—The setting up and adjusting of millin^g machines for, and the cutting of spur, bevel, and spiral gears, and worm and wheel. First term, Junior year (about three weeks). Two periods per week. Prerequisite 1005.

1007. TOOL MAKING.—The making of reamers, milling cutters,

taps, dies, etc. The use of the grinding machine for finishing and sharpening them. First term, Junior year (about eight weeks). Two periods per week. Prerequisite 1006.

1008. PUNCHES AND DIES.—The making of blanking and forming punches and dies for press work. The machines of the preceding courses are used and, in addition, the filing machine, laps, grinding machine, and the press. Second term, Junior year. Two periods per week. Prerequisite 1005-6-7.
1009. REPAIRING.—Students are required, under instruction, to instal new machinery, to repair and adjust broken apparatus, to make jigs, fixtures, etc., for use of the Department. Third term, Junior year. Two periods per week. Prerequisite 1005-6-7-8.
1021. TOOL DESIGN.—The design of simple and compound blanking, and forming, punches and dies; jigs, fixtures, etc. (Lectures and drafting room.) Third term, Sophomore year. Three periods per week. Prerequisite 441-442.
1022. KINEMATICS.—Relative motions of machine parts, including links, quick-return-motions, gears, cams, belting. The mechanism is analyzed by center lines, and then the practical shape and size of each part designed. (Lectures and drafting room.) First term, Junior year. Four periods per week. Prerequisite 452, 622-23-24 (623-24 may be taken in same term as 1022).
1023. MACHINE DESIGN.—The design of complete machines such as drill presses, shapers, punches, etc., being the practical application of the principles of Kinematics and Mechanics. (Lectures and drafting room.) Second and third terms, Junior year. Three and two periods per week. Prerequisite 1022.
1024. MACHINE DESIGN.—The designing of derricks, cranes, hoists, and conveying machinery, involving gears, pulleys, cables, chains, etc., and special study of friction. (Lectures and drafting room.) First term, Senior year. Three periods per week. Prerequisite 1022.
1025. STEAM ENGINE DESIGN.—The study in detail of various

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types of engine valves, and governors. The complete design of an engine—all of the necessary computations, detail and assembly drawings. (Lectures and drafting room.) First and second terms, Senior year. Three periods per week. Prerequisite 1031-32, 1022-23.

1026. POWER PLANT DESIGN.—The study of the various phases of steam, and hydraulic power plants. The student is given data for an actual proposition, and is required to make a careful study of all the details, and then draw up a consulting engineer's report, bringing out clearly the proposed scheme of development, estimated cost, and probable returns to the promoter. Upon the acceptance of this report, the design is undertaken. The building, arrangement of machinery, piping, etc., are worked out in detail, and complete drawings made. Specifications, prices, drawings of equipment, are offered by the instructor who acts as salesman, and at the same time keeps careful check of the work as it progresses. (Lectures and drafting room.) Second and third terms, Senior year. Four periods per week. Prerequisite 1031, 1024.

1027. MACHINE DESIGN.—A special short course in design for Senior Mining Engineers, involving some of the principles of gears, hoists, conveying machinery, friction, pulleys, cables, etc., with reference to mine work. (Lectures and drafting room.) First term, Senior year. Two periods per week. Prerequisite 452, 622-23-24.

1031. STEAM ENGINEERING.—Primarily a descriptive course dealing with the selection, adjustment, care and repair, of various types of engines, turbines, boilers, pumps, and all accessories. Higher mathematics and theory is reduced to a minimum, for the object of this course is not to teach the design of steam apparatus, but the intelligent operation of same. (Lectures and recitations.) Second term, Junior year. Four periods per week. Prerequisite 927, 461-2-3, 452.

1032. THERMODYNAMICS.—The theory of heat, and its applications to engineering. Perfect gases, steam, hot air engines, steam engines, turbines, injectors, refrigerating machines. (Lectures and recitations.) Third term, Junior year and first

term, Senior year. Two and three periods per week. Pre-requisite 1031.

1041. MECHANICAL ENGINEERING LABORATORY.—Experiments with engines, pumps, injectors, condensers, and steam power plant apparatus, with special reference to the power derived, steam consumption, setting of valves, and general operating conditions. (Laboratory and reports.) Second term, Junior year. One period per week. Prerequisite may be taken only with, or following 1031.
1042. STEAM LABORATORY.—Experiments with steam apparatus to supplement, as far as possible, course 1032. (Laboratory and reports.) Third term, Junior year. One period per week. Prerequisite 1031, and taken with 1032.
1043. MECHANICAL ENGINEERING LABORATORY.—Experiments on various types of engines, boilers, pumps, injectors, condensers, etc. Individual efficiency tests, and assembly or unit tests, under different conditions of operations. (Laboratory and reports.) First, second and third terms, Senior year. Two periods per week. Prerequisite 1041.
1051. GAS ENGINEERING.—A study of producer gas, water gas, and illuminating gas, the manufacture of each, and uses for furnaces, lamps, and gas engines. (Lectures and recitations.) Second term, Senior year. Four periods per week. Prerequisite 911, 1031.
1061. HEATING AND VENTILATING.—Heating of buildings by hot air—natural draft and forced; hot water, and steam—direct and indirect radiation. Ventilation of buildings. Computations and sketches for assigned problems. (Lectures and recitations.) Third term, Senior year. Three periods per week. Prerequisite 452, 1031.
1071. COMMERCIAL ENGINEERING.—A study of patents and the procedure for obtaining them; piece work and flat rates; time and cost keeping; organization of working force, location of factories, production of product; contracts, specifications, etc. (Lectures and recitations.) Third term, Senior year. Three periods per week. Prerequisite 381, 372.

1081. **THESIS.**—A thesis is required of every student as a condition of graduation. The subject may be chosen by the student, but it must be approved by the Department. The shops, laboratories, and all apparatus belonging to the Department may be used for this work. Third term, Senior year. Two periods per week.

GENERAL INFORMATION.

ATTENDANCE.

Attendance on all college exercises is strictly required. Absences on account of sickness, or for other satisfactory cause, may be excused, and leave of absence will be granted at the request of parents when absolutely necessary. In such cases the absence is excused, but the student is invariably required to make up such work as he may lose by reason of his absence. Reports are sent to parents whenever the absences of their sons exceed a reasonable number. In case of the absences becoming excessive the faculty will punish the neglect with suspension. Absences incurred at the beginning and end of a term, especially if they involve absence from examinations, and immediately preceding and succeeding holidays, are regarded with special disapproval, and under ordinary circumstances will not be excused.

Each student is expected to have at least sixteen recitations each week. No student is permitted to take a course involving fewer hours of recitation without a special vote of the Faculty. Three hours of field or laboratory work are regarded as equivalent to one recitation period. The regular gymnasium drills are also regarded as required exercises as far as prescribed.

EXAMINATIONS.

Examinations are held at the close of each term on the studies of that term, and may be either written or oral, or both, at the option of the professor in charge. In addition to these regular examinations, partial ex-

aminations and written recitations are held from time to time during the term, with or without notice to the students. Failure to attend an examination, except for reasons of absolute necessity, is regarded as a serious delinquency, and will be dealt with according to the circumstances of each case.

STANDING.

The scholarship of students is determined by the results of the examinations and daily recitations combined.

Students entering with conditions are required to make them up before the end of the term next after that in which they enter.

Students failing to pass in the studies of any term are required to make up such studies before the beginning of the term after that in which the failure occurred, and they may be specially directed to do so at an earlier date. Students who do not comply with these regulations will be put on probation in scholarship, or lose standing and be only "permitted to recite," or be dropped into the next lower class, as the Faculty may in each case, decide.

Reports of the standing of the students are made to their parents or guardians at the end of each term.

RULES GOVERNING ABSENCES AND RE-EXAMINATIONS.

1. No absence from a recitation, a lecture or a laboratory exercise shall be excused.

2. If the number of a student's absences in any term from the exercises in any subject exceed the number of exercises per week in the subject, but not double the number, he may, at the discretion of the instructor in charge, be debarred from the term examination

in the subject, provided the number of absences is not less than three.

If he be debarred, he must pass on the subject before the first day of the next term or repeat the subject with a following class.

3. If the number of a student's absences in any term from any subject exceed double the number of exercises per week in the subject, he must repeat the subject with a following class, provided that the number of such absences must exceed three.

4. If, for special reasons, the head of the department recommend it, the faculty may vote that a student who would otherwise be required to repeat a subject by Rule 3 be given one examination on the subject. If he fails in this examination, he must repeat the subject.

5. Before a student may take the examination provided for in Rule 4, he shall be required to pay to the treasurer of the college a fee of two dollars and show the treasurer's receipt for the same to the teacher in charge of the examination.

6. The instructor in charge of each subject shall, at the beginning of each week, post in some place easily accessible to the students interested, the number of absences from the exercises of the subject of each student to date.

7. All absences shall be reported weekly to the clerk of the faculty, who shall record them.

8. When the number of a student's unexcused and unpermitted absences from the religious and other exercises of the college reaches five, he shall be warned by his class dean; when it reaches ten, he shall be again warned; when it reaches fifteen, he and his parents shall be warned that he is in danger of being dropped from the college rolls; when it reaches twenty, he shall be dropped. If at the end of a term a student has twenty such absences he shall have five absences charged against him on the next term for every five or fraction of five absences above nineteen which stand against him.

PERMITTED ABSENCES.

9. In case of absence due to prolonged sickness or request from home for urgent reasons approved by the dean, the student shall, as soon after the absence as possible, present to the dean a written statement of the cause of his absence, after which the dean shall give the student an exact statement of the duration of his absence,

which he shall present to his instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then take it to the dean, and the absences indorsed upon it shall not be counted by the clerk in making up the number of Rule 8.

When such permitted absence causes the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done by the class during as many of these absences as are required to bring his absences below the debarring number by an examination to be held within a month of the absences.

If he fail in this examination, he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before this special examination may be held, the student shall pay to the treasurer of the college a fee of two dollars, and shall show his receipt for the same to the instructor in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

10. When permission to be absent from town has been given to a student by vote of the faculty or by the President acting for the faculty, such student shall receive from the dean an exact statement of the duration of such absence, which he shall present to his instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then return it to the dean and the absences indorsed upon it shall not be counted by the clerk in making up the numbers of Rule 8.

When such permitted absences shall cause the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done during as many of these absences as are necessary to bring his absences below the debarring number by an examination held within a month of the absence.

If he fail in this examination he shall be debarred from the term examination and required to pass on the subject by a special ex-

amination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before this special examination may be held, the student shall pay to the treasurer of the college a fee of two dollars and shall show his receipt for the same to the instructor in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

11. If professors, in whose departments a student has the majority of his hours per week, report to the faculty that the student is neglecting his work, he and his parents shall be warned that he is in danger of being dropped from the college rolls. If a second such report be made, he shall be dropped.

RE-EXAMINATIONS.

1. A student who fails at the regular term examination in any subject, shall be entitled to one re-examination.

2. If, for special reasons, the head of the department recommend it, the faculty may vote that a student who has failed in the re-examination provided for in Rule 1 may be given a second re-examination.

3. Before a student can take the second re-examination provided for in Rule 2, he shall be required to pay to the treasurer of the college a fee of two dollars and show the treasurer's receipt for the same to the instructor in charge of the examination.

4. If, at the beginning of the college year, a student has failed to pass on his conditions of the preceding year in the departments of Mathematics, Mechanics, Physics, French and German, and in Projections and Descriptive Geometry in the department of Graphics he shall be required to repeat the subjects in which he is still conditioned.

5. When subjects, which closely depend upon each other, are continued through successive terms, the department interested may require that all conditions of any terms in those subjects shall be made up within two weeks from the beginning of the next term, in order that the student may go on with those subjects.

6. All students who have one or more conditions in Freshman

English at the end of the third term are required to take English with the incoming Freshman class and to remain in the course till they have satisfactorily passed off their conditions. No re-examinations are given in the course.

7. A student who fails in mathematics in any term of the Freshman year or in the first term of the Sophomore year shall report for re-examination at nine o'clock of the day preceding the first day of the next term and if he fails to make up his condition he shall take an extra class of two hours per week for one term in the subject in which he failed, said class to rank as a regular part of his schedule of study.

CONDITIONS.

1. A student who fails to complete satisfactorily the work prescribed in any subject is permitted to continue his studies upon *condition* that he make up the failure, or remove the condition, within a specified time.

2. Where no other time is fixed the condition must be removed before the beginning of the third term after that in which the failure occurred. If the condition is not made up before that time the student shall repeat the subject.

3. A student shall not be enrolled as a member of the Sophomore class who has any entrance conditions unless by vote of the faculty he be permitted to make up his deficiency by taking an equivalent amount of college work, in addition to his regular schedule, in satisfaction of the condition.

4. A student shall not be enrolled as a member of the Junior class who has any Freshman conditions, nor of the Senior class who has any Sophomore conditions, and all subjects prior to Senior year must be made up before the beginning of the second term of the Senior year in order that the student may be a candidate for a degree at Commencement of that year. A student who would otherwise be a candidate for a degree in that year may be permitted by vote of the faculty to remove conditions by repeating the subjects with a class, but not by a special examination.

5. A student who, at the opening of a college year, has overdue conditions representing more than twelve (12) hours of work shall fall back to the next class.

6. A student who, at the opening of a college year, has overdue

conditions representing sixteen (16) hours of work, whether he be a regular or a special student, shall be dropped from the college unless he can arrange to enter a lower class as a regular student with conditions aggregating less than eight hours of work.

NOTE.—By “hours of work” is meant the number of exercises scheduled in that subject for one term.

GRADUATION.

Students who have pursued an entire course as prescribed and have successfully passed their examinations are recommended to the trustees for the first academic degree in course. Such recommendations are ordinarily acted upon and the degrees are conferred at Commencement, at which time the students receive diplomas from the President of the College. At Commencement the faculty awards such honors as it sees fit to those who are to receive degrees. These honors ordinarily consist of a valedictory oration, a Latin salutatory, and other honorary orations and theses.

COMMENCEMENT.

The College year is so arranged as to provide a term of 14 weeks immediately before the Wednesday preceding Christmas day and two terms of 11 weeks each after the Christmas vacation, the vacation at Christmas and in the Spring being two weeks each. The annual Commencement usually falls on the third Wednesday in June but occasionally the fourth Wednesday. The three days immediately preceding Commencement day are set apart for special exercises. On Sunday, the first of these days, a Baccalaureate sermon is preached in the College chapel at eleven o'clock in the morning; and in the evening a sermon is preached in the auditorium of Pardee Hall before the Brainerd Society of the College

by some distinguished minister selected by the Society.

The preacher for 1911 was Rev. Albert J. Weisley, D.D., of Trenton, N. J.

On Monday the Senior class holds its Class Day exercises on the campus.

The alumni and literary societies hold their reunions on Tuesday, and orations are delivered before the literary societies in the Society halls.

The regular Commencement exercises are held in the auditorium of Pardee Hall on Wednesday morning, the afternoon being occupied by the alumni dinner. All these exercises are open to the public. Various other exercises of an athletic or social nature are conducted on the part of the students under a general supervision by the faculty.

DEGREES.

THE FIRST DEGREE.—The degree of *Bachelor of Arts* is conferred on the graduates of the Classified Course; *Bachelor of Philosophy*, on those of the Latin Scientific Course; *Bachelor of Science*, on those of the General Scientific Course; *Bachelor of Science* (in Chemistry), on those of the Chemical Course; *Civil Engineer*, on those of the Civil Engineering Course; *Engineer of Mines*, on those of the Mining Engineering Course; *Electrical Engineer*, on those of the Electrical Engineering Course; *Mechanical Engineer*, on those of the Mechanical Engineering Course.

MASTER'S DEGREE.

MASTER OF ARTS.—The degree of *Master of Arts* may be conferred one year after graduation on any *Bachelor of Arts* who has pursued a prescribed course of study, equivalent to sixteen recitations per week, during one year in residence, passed the examinations, and presented a satisfactory thesis.

The same degree may be conferred two years after graduation on any *Bachelor of Arts* who shall have devoted at least one year exclusively to advanced study under the direction of the faculty,

passed examinations in the studies pursued, and presented a satisfactory thesis.

Candidates for this degree must, in all cases, register on or before October 1st, and examinations must be held at the College at least once in each college term. Theses must be presented for approval not later than May 1st. A registration fee of \$5 and tuition fee of \$100 per annum for residents, and \$45 per annum for non-residents, is exacted of all graduate students.

MASTER OF SCIENCE.—The degree of *Master of Science* may be conferred upon any graduate of the scientific department upon conditions similar to those prescribed for the degree of Master of Arts.

CERTIFICATES.

Students who have been admitted to any department of the College, and have passed satisfactory examinations therein, may obtain certificates of the work which they have done if they have been in attendance not less than one year.

RELIGIOUS INSTRUCTION.

The aim of Lafayette College is distinctly religious. Under the general direction of the Synod of Pennsylvania of the Presbyterian Church its instruction is in full sympathy with the doctrines of that body. At the same time religious instruction is carried on with a view to a broad and general development of Christian manhood within the lines of general acceptance among evangelical Christians, the points of agreement, rather than those of disagreement, being dwelt upon.

Prayers are held each morning in the chapel at 7 : 50 and religious services in the chapel Sunday mornings at 11 o'clock. All students are expected to attend these services. No exceptions will be made to this rule for morning prayers. Where there is some exceptional

reason assigned by the parents, students will be permitted to attend one of the churches in Easton instead of the Sunday morning service. This permission will be granted only on request of parents and for sufficient reason.

Special sermons are preached before the College from time to time by distinguished ministers. The preachers for 1911 were: Rev. Joseph C. Robbins, Traveling Secretary of the Student Volunteer Movement; Rev. Charles R. Erdman, Princeton, N. J.; Rev. W. J. Wanless, M.D., President of the Medical Missionary Association of India; Rev. Joseph H. Odell, D.D., Scranton, Pa.; Rev. Courtney H. Fenn, D.D., Pekin, China; Rev. Arthur J. Brown, D.D., Secretary of the Board of Foreign Missions; Rev. James I. Good, D.D., LL.D., Philadelphia, Pa.; Rev. John B. Grier, D.D., Danville, Pa.; Rev. James Oscar Boyd, Ph.D., Princeton, N. J.; Rev. Silas Evans, Ph.D., Ripon, Wis.; Rev. George L. Richmond, D.D., Boonton, N. J.; Rev. James A. Kelso, D.D., Pittsburgh, Pa.; Rev. Robert E. Speer, D.D., Secretary of the Board of Foreign Missions; Rev. Charles L. Thompson, D.D., LL.D., New York City; Rev. William M. Dager, Batanga, West Africa; Bishop Arthur S. Lloyd, President of the Protestant Episcopal Board of Missions; Rev. John Fox, D.D., New York City; Rev. Leighton W. Eckard, D.D., Philadelphia, Pa.; members of the faculty and the local clergy.

The preacher for the Day of Prayer for Colleges, 1912, is Rev. Robert Mackenzie, D.D., of the College Board of the Presbyterian Church.

Instruction in the Bible has always held a prominent part in the College, and a full account of the courses in Bible study will be found on pages 98-100.

LECTURES.

Special courses of lectures are given annually in connection with several departments and will be found under those departments. A more general course of a popular character is given each year.

TERMS AND VACATIONS.

The College year is divided into three terms, with intervening vacations, as given in the Calendar on page 6. All the classes are examined at the close of each term, and a report sent to the parents or guardian. Students are required to be present punctually at the beginning of each term, and are not allowed during term-time to be absent from town, except by written permission from the Dean.

The Wednesday before the third Thursday of October in each year is observed as Founders' Day, in memory of those who founded the College and of those who have since contributed to its usefulness. On Founders' Day, 1911, an address was delivered by President Joseph Swain, M.S., LL.D., Swarthmore College, Swarthmore, Pa.

BUILDINGS, LABORATORIES, LIBRARIES.

The College grounds are situated upon the summit of a beautiful hill, overlooking the city of Easton. They are reached by a flight of stone steps, which ascend the bold front of the hill directly from the head of Third Street, or by electric cars, which skirt the face of the hill by a gradual incline. At the head of the steps stands the monument erected by the alumni association to their comrades who "died for the Union." The grounds contain about sixty acres terraced and laid out under



VAN WICKLE MEMORIAL LIBRARY.

the direction of Donald G. Mitchell. The buildings upon the campus are forty in number. The oldest of these is

SOUTH COLLEGE.

The central portion of this building was erected in 1833 and was the original college building. At later periods east and west wings were added and the whole building was thoroughly overhauled and modernized in 1909. It now contains a large part of the class and lecture rooms for the academic department, and the basement and first floor of the east wing have been fitted for a lecture room and laboratory for the Department of Mining Engineering.

The first and second floors of the west wings are occupied by the College Chapel. The remaining space in the main building and in the wings is devoted to dormitory rooms which have been thoroughly modernized, and every comfort afforded by modern plumbing and sanitary arrangements has been added.

The building has also been beautified by a portico on the south front and by many improvements in the general finish of the building.

The alterations have been intended to secure every needed improvement without altering the general effect of the building. The sentimental value of its historical place in the college life and thought have not been lost sight of.

PARDEE HALL.

The most commanding position on the campus is occupied by this building, the most conspicuous evidence of the liberality of the late Ario Pardee, which reached to every department of the college. Here the departments of civil, mining, and electrical engineering are sup-

plied with thoroughly equipped laboratories and lecture-rooms, and the museums of these departments, and of general geology, mineralogy, and natural history, are to be found. The Ward Library and the handsome rooms of the two literary societies are also in this building, and the central portion of the second and third floors of the main building contains a beautiful auditorium, in which the Commencement exercises, lectures, and other public entertainments are held.

THE VAN WICKLE MEMORIAL LIBRARY.

The Van Wickle Library was dedicated on May 30, 1900. It has given to the College one of the most needed additions to its equipment. A beautiful building of Pompeian brick and terra cotta, thoroughly furnished with the most approved appliances for library work, it is at once a most beautiful and useful feature in the College's development. It contains a large reading room, in which the periodicals and books of most constant reference are to be found; a reference book department; a large room for the general storage of the library; librarian's room; and small rooms for special work.

The Library having grown to such proportions as to require additional storage room for books, Miss Marjorie R. Van Wickle, in January, 1911, presented to the College a sum sufficient to erect an addition to the Library, which is now being built. This addition will contain book stacks sufficient for the storage of from ninety to one hundred thousand volumes. It is in the form of an extension to the north of the original building and was a part of the original plan. It will provide for the growth of the Library for many years to come and is a

beautiful and valuable addition to the efficiency of the Library.

JENKS BIOLOGICAL HALL.

This building was erected in 1864-'65 by the late Barton H. Jenks, of Philadelphia. It was recently entirely remodeled.

THE GAVLEY LABORATORY OF CHEMISTRY AND METALLURGY,

completed in 1902, is occupied by the departments of chemistry and metallurgy. The building consists of three stories, and is constructed of Indiana stone, colonial brick, and gray terra cotta. It is fireproof, with steel and cement floors, and gives a thoroughly modern equipment to these departments. This building contains also the Henry W. Oliver Chemical and Metallurgical Library.

THE ASTRONOMICAL OBSERVATORY,

in addition to the Observatory proper, contains a lecture-room, with accommodations for the students in astronomy.

WEST COLLEGE

contains the lecture-room for two generations used by Prof. Francis A. March, the great scholar and beloved teacher and now occupied by Prof. Francis A. March, Jr., and the offices of the registrar and treasurer of the College.

GYMNASIUM.

The importance of physical culture was early recognized by this College and a gymnasium was erected in 1884 and placed under the direction of a competent instructor. At the present time regular drills are required of the

Freshman and Sophomore classes four times a week. Optional training in general gymnastics and fencing offered to upperclassmen, and the students are encouraged to participate in such outdoor sports as their physical development fits them for.

The gymnasium is equipped with all the apparatus requisite to physical training, with lockers, bath and dressing-rooms. Before taking part in the gymnasium exercises, or the outdoor sports every student is given a thorough examination, and great care is taken to give each student such exercises as he needs and to avoid anything that would be injurious. In addition to the Director, one of the most able and experienced physicians of Easton acts as consulting physician, and requests for special work or exception from any prescribed work are passed on by the Director and the Consulting Physician. No excuses from the required drills will be granted except upon the recommendations of these officials. A fine athletic field adjoins the campus. It is admirably equipped for athletic contests. Four recent classes erected a commodious field house on it. Here the contests in football, baseball, and track athletics, in which the students have excelled, are held.

No student may take part in any public contest without written permission from his parents previously filed with the Clerk of the Faculty.

THE DORMITORIES.

A complete reorganization of the dormitory system was effected in the summer of 1900 by the building of central structures, known as Knox and Fayerweather Halls, to connect Blair and Newkirk Halls and Martien and Powell Halls respectively, and the facing of the

completed buildings with mottled Pompeian brick, handsomely trimmed with red terra cotta. The architectural beauty of the buildings is in marked contrast with the former appearance of the separate building. A complete sanitary plumbing system of baths, sinks, closets and electric lights has been installed in all the buildings. These improvements leave nothing to be desired for the health and comfort of the students.

FRATERNITY HOUSES.

Early in the current century the crowded condition of the dormitories made additional provision for rooms for the students imperative. To meet this need and to provide comfortable accommodations for their students, the fraternities represented in the College began the erection of a series of buildings, nearly all of which are situated on the College Grounds, which provide rooms and in most cases all of the conveniences of student life for the members of the various fraternities. There are now seven fraternity houses built upon a similar plan of providing accommodations for about eighteen students each. The buildings are a beautiful addition to the College equipment and are under the same supervision as the College Dormitories.

INFIRMARY.

A small building on McCartney Street immediately adjoining East College has been set apart for the use of students suffering from contagious diseases. This building has but rarely been called into service, but on several occasions has served to prevent the extension of contagion by the isolation of single cases of diphtheria and scarlet fever which have occurred. The building is

intended exclusively for the use of students rooming in the college buildings. For non-contagious cases of a serious character, the excellent hospital of the city offers the best modern conditions of treatment.

BRAINERD HALL.

This building for the Y. M. C. A., the gift of J. Renwick Hogg, Esq., '78, of the Board of Trustees, was erected in 1902. It is a three-story gray stone building in the Tudor Gothic style. It contains a large room for the meetings of the society, and reading, writing, and committee rooms; also a trophy room of the athletic association, a room for the collection of curios from foreign missionary fields, and bowling-alleys in the basement.

Its object is to afford a home under active Christian influences for all forms of student life.

MECHANICAL LABORATORY AND SHOPS.

A building to contain the laboratories and shops of the Department of Mechanical Engineering is now in course of construction, and will be completed about April 1, 1912.

This building is 102 feet by 185 feet, of steel and concrete construction, and contains on the main floor a wood-working shop 45 feet by 75 feet, a machine shop of the same dimensions, and a laboratory 45 feet by 150 feet, for steam and gas engineering. In the rear a forge shop and foundry 40 feet by 45 feet each, also boiler and storage rooms, lockers and lavatories.

This building is a part of a proposed plan of a complete set of engineering buildings to furnish better facilities to carry on the work of the four departments of engineering.

CENTRAL STEAM PLANT.

During the autumn of 1909 a central steam plant was established with a power house built of stone with a concrete roof containing large boiler and storage rooms with every convenience for the running of the plant. The power house is equipped with four 150-horse-power boilers which are sufficient for the present needs of the College and any probable additions for a considerable number of years to come. Provision is also made for the addition of an electric power plant whenever it shall be deemed desirable. This plant is now in full and successful operation and promises to be a great value to the College.

OTHER BUILDINGS.

The remaining buildings consist of a large GREENHOUSE, a useful adjunct to the department of botany, and also supplying flowers and plants for the adornment of the grounds in summer and of the buildings on public occasions. Besides these, a number of buildings are occupied as the HOMES OF THE MEMBERS OF THE FACULTY. The intimate relations resulting from the residence of both faculty and students upon the College grounds are regarded as one of the most wholesome features of the College life.

LIBRARIES AND READING-ROOM.

The main regular College Library occupies the Van Wickle Memorial Library, described previously. The College Library was established at the foundation of the College, and has had a steady and uninterrupted growth since 1832, and is chiefly made up of books bearing directly on the courses of instruction. The Ward Li-

brary, the gift of the heirs of C. L. Ward, Esq., of Towanda, is largely made up of books of general literature and history and Political Science. Each of the technical departments has also a collection of books, magazines, and other scientific publications in rooms in immediate connection with their lecture-rooms and laboratories. By the gift of \$5,000 Mr. Henry W. Oliver laid the foundation of the H. W. Oliver Chemical Library in the new Gayley Laboratory. The foundation has been added to by gifts from Prof. Edward Hart and others, and the incorporation of the College's collection of chemical works.

A friend of the College has bought and presented to the Henry W. Oliver Chemical and Metallurgical Library all the pamphlets, about three thousand in number, belonging to the library of the late Prof. Johannes Wislicenus, of the University of Leipsic.

The literary societies, also, have libraries numbering about 6,000 volumes, largely of a literary character, which valuably supplement the more solid libraries of the College.

The College Library contains a papyrus scroll, five feet long, from a mummy at Thebes, with a hieratic inscription—pronounced by Seyffarth the finest he has seen—presented by the late Hon. John Garrett, of Baltimore, of the class of '37, and a collection of prints and medals of General Lafayette presented by the late President William C. Cattell, D.D., LL.D.

There is also a full-length portrait of Lafayette, by Healey, presented by the late Dr. Thomas W. Evans, of Paris.

ALUMNI ALCOVE.—A collection of books and pam-

phlets written by the students, alumni, faculty and trustees of the College is being gathered and set apart as a "Lafayette Library" to represent the literary activities of the College. This unique and valuable collection now numbers about 400 volumes, and includes a full set of the College catalogues from 1832 to the present time, the Commencement addresses, and official publications of the College.

The LIBRARIES have received gifts, which are hereby gratefully acknowledged, from the following individuals and institutions:

Individuals:

Arthur Latham Baker; Miss Millicent Bingham; G. E. Brasefield (2); Prof. Selden J. Coffin; D. G. Dery (Print of Lafayette; Autograph Letter); B. F. Fackenthal, Jr.; Maurice A. Filson; Frank Firmstone (115); A. C. Gaebelin; Bishop C. C. Grafton; Prof. Edward Hart (34); Oscar J. Harvey (2); Job E. Hedges; Estate of Mrs. James D. Hunter (18); Nicholas V. R. Hunter; Rev. Henry E. Jackson; Melvil Jameson; M. H. Jones, Jr. (17); Joshua L. Miner (periodicals); James Monaghan (7); Rev. Robert Hamill Nassau (3 vols., pamphlet); Miss Ellen Seton Ogden (pamphlet); Prof. William B. Owen (4); Hon. A. Mitchell Palmer; Hon. Boise Penrose (8); Prof. George Lansing Raymond; Mrs. J. M. Silliman (17); Abram C. Tully (2); Prof. James W. Tupper; Ethan Allen Weaver (2 vols., pamphlet); The Misses Williams (2).

Firms and Institutions:

Bryn Mawr College (2); Bureau of Railway Economics; Bureau of Railway News and Statistics (2); Bureau of Survey, Philadelphia; Connecticut State Library; Ford, Bacon and Davis (2); Jones and Lawson Machine Co.; Melange Managers (2); National Lumber Manufacturers' Association; New Jersey Board of Health; New York State Educational Department (2); New York State Water Supply Commission; Peace Association of Friends (5); Royal Society of Canada; Smithsonian Institution (10); University of Pennsylvania; Vill Commission of Chicago.

United States Department:

Bureau of American Ethnology (2); Commissioner of Education.

The Class of 1871 has given to the College a fund, the proceeds of which are to be used for the purchase of the publications of the Early English Text Society. The library now contains a large and valuable collection of these.

The class of 1875 at its reunion in 1905 by the gift of one thousand dollars established an alcove in the library to be known as "The Francis A. March Alcove."

The class of 1892 at its decennial reunion in 1902 established an alcove in the library devoted to American literature. Two hundred volumes have been purchased and additions will be made from time to time.

SCIENTIFIC COLLECTIONS.

These are extensive and valuable, and are rapidly increasing from year to year by gifts from societies and individual donors, and by special appropriations in addition to the fees for registration and matriculation.

Among the most valuable of the collections may be mentioned the extensive herbarium, collected by Prof. Thomas C. Porter during forty years of enthusiastic labor; it is especially rich in North America plants and is believed to contain the most complete flora of Pennsylvania in existence and the series of Ward's celebrated casts, illustrating geology and palaeontology.

The apparatus in the department of physics and applied mechanics, the instruments used in the departments of astronomy and engineering, and the scientific equipment of the numerous and extensive laboratories meet the demands of advanced instruction in these departments; a special feature, however, is the series of nine hundred wall charts, executed at the College by Gustave Garnier, under the direction of the professors in the departments of astronomy, chemistry, physics and applied mechanics, metallurgy, and natural history. There are valuable models in machine drawing, stone cutting, crystallography, and architecture.

COLLEGE SOCIETIES.

LITERARY SOCIETIES.

The *Washington* and *Franklin* societies were organ-

ized early in the history of the College and are conducted by the undergraduates. Both societies have well-furnished apartments in Pardee Hall, and valuable libraries. They meet every Wednesday evening for literary exercises, consisting of orations, essays, and debates. A generous rivalry for College honors exists between them, and each year representatives of the two societies from the Junior class engage in a public contest in oratory. On the day before Commencement the societies hold reunion meetings in their halls. These societies are an important part in College life and work, and *all the students are strongly advised to join them.*

BRAINERD EVANGELICAL SOCIETY.

The *Brainerd Evangelical Society*, as a society of inquiry, meets each Thursday evening and on the first Friday of each month in the interest of missions, and for the promotion of Christian effort. Its public anniversary is held on Sabbath evening of Commencement week, at which time a sermon is preached usually by some former members of the Society. In 1911 the preacher was Rev. Albert J. Weisley, D.D., '91, Trenton, N. J.

BIOLOGICAL SOCIETY.

The *Biological Society* is for the purpose of making its members intelligent concerning the important biological questions of the day, enabling them to appreciate the value of research in nature. The membership consists of those students of the three upper classes who are either prospective or present members of the classes in biology, and of such graduate students as are interested in the laws of life comprehended through the natural history sciences.

CHEMICAL CLUB.

A *Chemical Club* has been organized by the students, for reading and discussing papers contained in the current chemical magazines, and to listen to lectures from visiting chemists.

DEUTSCHER VEREIN.

Der Deutscher Verein is an organization of students and officers interested in the study of German language and literature, and of German life and culture. Meetings are held fortnightly on Friday. Advanced students and others who desire to keep up their knowledge of German are invited. The program consists chiefly of conversations, addresses and the singing of German songs.

CLASSICAL UNION.

The *Classical Union* is an association which aims to bring together the students of the culture courses and to promote the interests of classical study in the College. Lectures on important subjects are given from time to time by members of the faculty and by eminent scholars from other institutions.

EXPENSES.

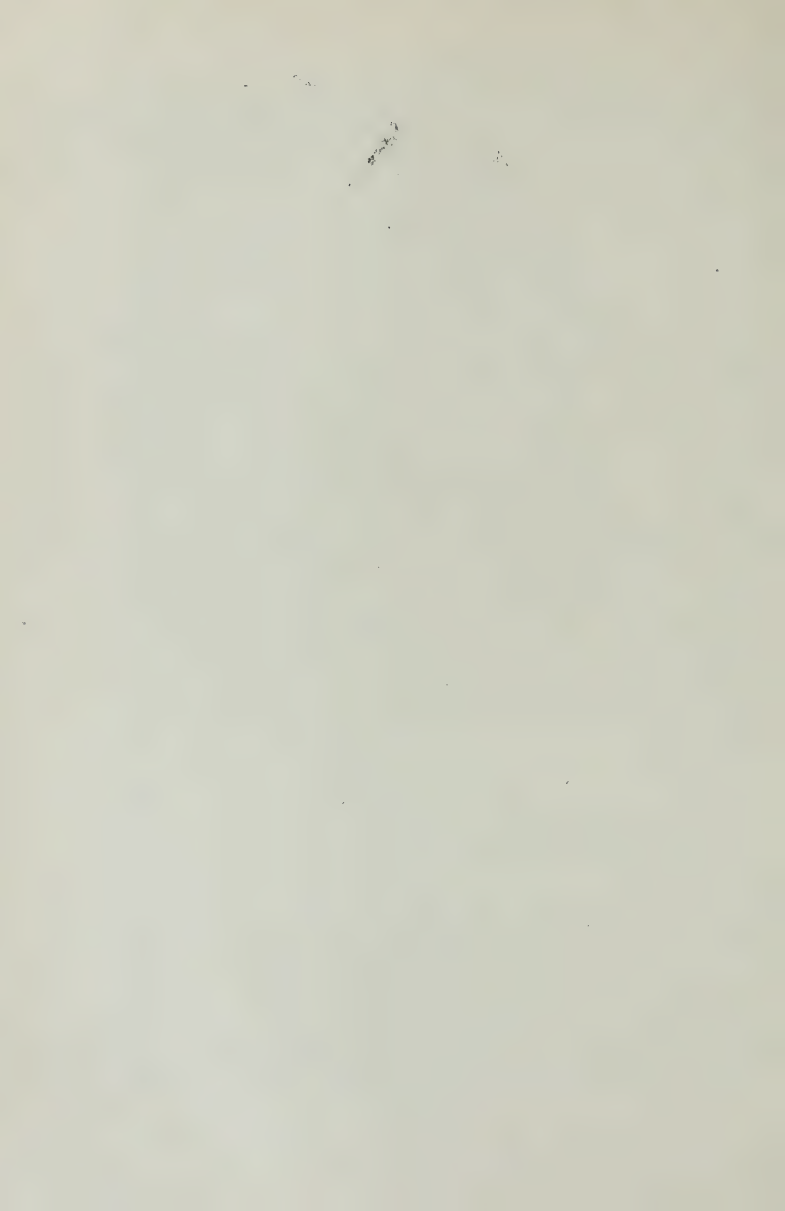
The annual College charges are \$145. This amount is made up as follows:

Tuition.....	\$100.00
General expenses	24.00
Library and Reading-room	15.00
Gymnasium	6.00

These fees are payable in three instalments at the be-



SOUTH COLLEGE.



ginning of each term. In addition to the above fees the following special fees are charged:

Entrance Fees.—Each student pays \$5 when he is registered for examination on entering College, and \$10 when he is matriculated, thirty days afterwards. These fees are appropriated in part to the increase of the scientific collections and apparatus. No fees are charged for diplomas.

Laboratories and Fees.—Apparatus for the use of students in the chemical laboratories will be furnished and charged to their account, and the charge canceled for that returned in good condition. Chemicals and all other materials will be charged according to the average cost. A deposit sufficient to meet these expenses is made on entering the laboratories. In the physical laboratory a fixed charge of \$5 per term is made for supplies and the use of apparatus.

A deposit of \$1 is also made at the beginning of each term to pay for public damages, the unexpended balance of which is returned to the student at the end of the year.

Scholarships.—Aid is given to young men of ability, industry, and character who are properly recommended to the College authorities. It is the object of all scholarships granted under this head to aid worthy young men and to attract especially desirable students to the College. Special consideration has always been given to the sons of ministers and of teachers, and to candidates for the Christian ministry. The aim, however, has not been to create a favored class but to recognize the generous support which the College has received and peculiar advantages which young men of unusual early training bring

to the College. The amount of aid will depend upon the necessities of the applicant but in no case will exceed the amount of the tuition fees. Applications for aid should be made to the President as early as possible after the first of January of the year in which the student expects to enter. No aid is granted to students pursuing special or incomplete courses of study or to those who are not fully prepared to take advantage of the opportunities offered by the College.

Scholarships offered as prizes in certain schools will be under the same regulations as other aid. The endowed scholarships issued to individuals prior to the establishment of the Scientific Department will provide free tuition in the Classical or Latin Scientific Courses and one-half tuition in the Technical Courses.

BOARD, ROOMS, WASHING.

In all cases the place of boarding must be approved by the Faculty. The price of table board in clubs managed by the students at present averages from \$3.75 to \$4.50 per week. Board, including furnished room, in private families, is from \$4.50 to \$6 per week. Washing costs 40 cents per dozen pieces.

Unfurnished rooms in the College buildings rent for \$8 to \$33 a term; unfurnished rooms adjacent to the College premises for \$12 to \$16 a term, or furnished rooms for \$15 to \$30 a term.

The steam-heated dormitories are lighted by electricity, the cost of which to each of the occupants is \$6 a year. The charge for heating is \$12 a year for each occupant.

Students are expected to room in the College dormi-

tories unless they receive permission to room elsewhere. If they do not occupy College rooms, they are subject to an assessment to meet the loss to the College for rooms left vacant. The reason for this is that the funds of the College have been invested in the dormitories in order to secure cheap and convenient lodgings for the students, and it is to the advantage of all that the buildings should be occupied, the income from the investment being essential to the work of the College, and the students being protected against exorbitant rents.

Information in regard to the selection of rooms can be had from Professor Lyle, inspector of College buildings, the buildings being open for inspection during each term, and three days preceding the first day of each term. Rooms are assigned only to students who have been admitted to College, or who present full certificates from authorized schools, in the order of their application.

College Bills.—College bills must be paid in advance. No student is enrolled for any term until his bill is paid and a student may be dropped from the roll of the Faculty at any time upon notice from the Treasurer that his college bill is overdue and unpaid. It is the duty of every student to present himself at the office of the Treasurer at the opening of each term, see that his bill is correct and pay it. Those who wish their bills sent home may have them sent to their parent or guardian if prompt request is made after their bills have been examined and found correct. No bills will be sent home upon a general request, and any neglect of early attention

to a college bill will forfeit the right to any extension that would otherwise be granted.

For the convenience of the students it is arranged that payments of the bills shall be made by the Seniors on the first Thursday of each term, by the Juniors on the first Friday, by the Sophomores on the first Saturday, and by the Freshmen on the first Monday. No student is regarded as regularly enrolled for any term until his bill is paid. He may be dropped from the roll for neglect of his bill at any time upon notice from the Treasurer to the faculty. Where it is impossible for a student to pay his bill when due, the Executive Committee has power to extend the payment for a period of not more than thirty days from the beginning of the term. Such extension will only be granted upon request written filed with the Treasurer within ten days after the beginning of each term, giving a satisfactory reason for the extension asked for. A penalty of ten per cent. will be added to every bill remaining unpaid after the expiration of thirty days. No student, whose bill is unpaid, shall be permitted to take the term examinations.

Students entering after the middle of the term shall pay one-half of the College charges for the term. Students obliged, on account of sickness, to leave before the middle of the term may have refunded to them one-half of the College charges for the term; no reduction will be made to those leaving for any other cause.

Annual Expenses.—Some money for books and other incidental expenses will be needed, but, with close economy, the total annual expenses—exclusive of tuition, clothing and traveling expenses—need not exceed \$300, as will be seen from the following summary:

	Liberal.	Moderate.	Minimum.
General college expenses.....	\$ 24 00	\$ 24 00	\$ 24 00
Charge for College reading-rooms, gymnasiums, etc.....	21 00	21 00	21 00
Board, 36 weeks, at \$3.75 to \$4.50.....	160 00	144 00	135 00
Rent of College-room, \$24 to \$99.....	99 00	49 00	24 00
Light and fuel.....	18 00	15 00	12 00
Washing.....	25 00	16 00	9 00
Tuition.....	100 00	100 00	100 00
Books and stationery.....	38 00	21 00	16 00
	\$485 00	\$390 00	\$341 00
Deduct for sons of ministers, <i>et al.</i> , in Classical Course.....	.....	.....	\$100 00
			\$241 00
Deduct for same in other courses.....	.....	.....	\$ 50 00
			\$291 00
Lowest changes for nec- } Classical.....	.....	.....	\$241 00
essary expenses } Technical.....	.....	.....	\$291 00

Laboratory fees and damage assessment, which vary in amount, must also be added, while the personal expenses for clothing, etc., must be estimated according to individual experience. The first year will be made more expensive by the fees for registration and matriculation, and furnishings for room; \$300 will therefore be a small allowance.

Parents and guardians at a distance may deposit funds with some member of the faculty, who will pay particular attention to the pecuniary concerns of the student, settling his bills, and transmitting an account of the expenditure, for which services he will charge a commission. It is strongly recommended that parents

furnish their sons with little beyond what will meet their necessary expenses.

BEQUEST AND DEVICES.

Each state has special statutory regulations in regard to wills, and it is most important that all testamentary papers be signed, witnessed, and executed in all other respects according to the laws of the state in which the testator resides. In all cases, however, the name of the corporation must be accurately given, as in the following forms:

I give, devise, and bequeath to "Lafayette College," in Easton, Pennsylvania, its successors and assigns forever, the sum ofdollars, to be invested by said corporation in good real estate security, and the interest accruing therefrom to be applied to the support of the Professors in said College.

I give, devise, and bequeath a certain lot situated, etc., to "Lafayette College," in Easton, Pennsylvania, and to their successors and assigns forever, for the uses and purposes of said College, according to the provisions of its charter.

PRIZES.

The following prizes are offered annually:

THE FRANCIS A. MARCH PRIZE IN ENGLISH.

A prize of thirty dollars in books was given from 1862 to 1881 by the late Rev. William C. Fowler, LL.D., of Durham, Connecticut, and since 1881 has been continued by Henry A. Potter, M.S., class of '77, of New York, under the title of "The Francis A. March Prize," upon the following conditions:

"A committee of at least three shall be chosen by the faculty to determine which student of the Senior class has made the greatest proficiency in English philology.

"The decision of the committee is to be made after attending an examination in some English classic, conducted by the professor in English, and after reading essays written by the several members of the class, which shall contain a discussion of the language of some English classic."

The subject in 1912 will be the works of Sheridan.

THE ASTRONOMICAL PRIZE.

A prize of thirty dollars in gold is awarded to the student making the greatest progress in the study of astronomy in the Senior year.

MATHEMATICAL PRIZE.

Two prizes of the value of twenty dollars each are offered in the department of mathematics to those students of the Junior class, one in the Classical and general courses of the scientific department, and one in the technical departments, who shall have exhibited during the first two years of the course the greatest proficiency in the study of mathematics.

These prizes were founded, as was the astronomical prize above mentioned, in 1867, by Professor Traill Green, M.D., LL.D.

THE LOUNSBURY PRIZE IN CHAUCER.

A prize, consisting of books, is given to that student of the Sophomore class who shall present the best essay upon some one of the works of Chaucer. This prize was given in 1896, by Thomas R.

Lounsbury, professor of English at Yale University, and will be continued by friends of the College as the Lounsbury prize in Chaucer.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE.

A prize, consisting of books of the Early English Text Society, of London, is given to that student of the Sophomore class who shall at the close of the Sophomore year pass the best examination in "English before Chaucer." The examination is based upon selected texts announced from year to year, which in 1912 will be from the New Testament.

This prize was founded in 1871.

THE CLASS OF '83 PRIZE.

A prize of the value of fifteen dollars is annually awarded to that member of the Sophomore class who shall have attained the highest standing in his division of the class in Trench on the Study of Words.

This prize was founded by the class of 1883 at their graduation.

COLEMAN BIBLICAL PRIZE.

Three prizes, each of the value of twenty dollars, are awarded to those students of the Freshman class who have attained the highest standing in the several divisions of Biblical study in that year.

These prizes were founded by the Rev. Lyman Coleman, D.D., in 1880.

PRIZES IN ORATORY.

The Washington and Franklin literary societies appropriate one hundred dollars a year for prizes in oratory. Four contestants are chosen from each Hall to take part in the Junior Oratorical Contest, which is held in May. In the presence of a public audience three judges, approved by the faculty, hear the speakers and award the prizes. Their decision is based on the merits of the performances as to originality and force, with reference both to composition and delivery. The first prize is fifty dollars, the second prize thirty dollars, and the third prize twenty dollars.

CIVIL ENGINEERING PRIZE.

A prize of the value of fifty dollars, the gift of Carroll Phillips

Bassett, C.E., Ph.D., of the class of 1883, is annually awarded to that member of the graduating class who presents the best graduating thesis and attains the highest standard of scholarship in the Civil Engineering Course.

THE PARK PRIZE IN LATIN.

A prize of fifteen dollars for the Latin Department has recently been founded by Mr. Samuel R. Park, A.M., '84. In 1912 it will be awarded, on the work of the second and third terms Freshman class, for excellence in Horace.

HISTORICAL ESSAY PRIZE.

A prize consisting of a copy of his work, "*The Marquis de Lafayette in the American Revolution*," is given annually by Charlemagne Tower, Jr., LL.D., of Philadelphia, to that member of the Senior class who shall, on or before the first day of October, present the best essay on some subject connected with the relations of *France and the United States*. The essays must not exceed three thousand words in length. The subject for the year 1912 is: "*The Value of the French Alliance in the American Revolution*."

THE CHEMICAL ESSAY PRIZES.

A prize of five dollars in books is awarded each term to that member of the Junior or Senior class who shall present the best term theme on some chemical subject.

THE GILBERT PRIZE IN OLD ENGLISH.

By the will of Howard Worcester Gilbert, who died in Chester County, March 5, 1895, a bequest was left to the College, with the provision that a gold medal of the value of forty dollars should be awarded every two years to the student writing the best essay on the Old English Language and Literature, beginning with Beowulf, in the earliest Anglo-Saxon period, and extending down to the year 1070. Should the competitors be of equal merit, preference is to be given to residents of Pennsylvania.

The medal is an inch and three-fourths broad, three-sixteenths of an inch thick, and contains on its face a relief portrait of King Alfred with the date 871-901, surmounted by the Anglo-Saxon

phrase, "Naes he gold hwaete." The reverse shows a garland encircled with the legend, "Howard Worcester Gilbert Old English Prize. Founded 1895." Space is left for the name of the recipient.

This prize will be awarded at the Commencement of 1912. It is open to competition of students of Anglo-Saxon in the graduate course of 1911-'12. The essay must be handed in by May 1, 1912.

'85 PRIZE IN PHYSICS.

The class of 1885 founded a prize in 1897 in the sum of \$500, the annual income of which is given to that member of the Junior class who attains the highest rank in the studies of physics.

THE BLOOMBERGH PRIZE.

The class of 1888, at its decennial reunion, subscribed the sum of \$500, the annual income of which is awarded to that member of the Junior class who shall attain the greatest proficiency in the study of the French and German languages and their literatures.

THE B. F. BARGE GOLD MEDAL.

A prize of a gold medal of the value of \$100 was founded by Benjamin F. Barge, Esq., of Mauch Chunk, Pa., to be awarded to that member of the Senior class who shall deliver the best oration in an annual contest to be held on Memorial Day, May 30th. The contestants, not more than six in number, are to be chosen by a committee of the faculty from those members of the Senior class, who shall hand in orations on or before May 1st upon topics assigned by the committee not later than March 25th of each year.

BARGE MATHEMATICAL PRIZES.

By the bequest of the late Benjamin F. Barge, Esq., of Mauch Chunk, three prizes have been established for excellence in mathematical studies. These prizes will be awarded to members of the Sophomore class for excellence in the solution of original problems.

THE R. B. YOUNGMAN GREEK PRIZE.

The class of 1884, at its vigintennial reunion, subscribed the sum of \$500, the income of which is to be awarded to that member of

the Sophomore class who shall attain the greatest proficiency in Greek.

THE NEW SHAKSPERE SOCIETY'S PRIZE.

A prize of books is awarded to that member of the Junior class who passes the best general examination upon Shakspeare, his works, life, character, etc.

NOTE.—In all cases where a prize is awarded to an essay or oration the successful competitor must hand to the proper authority two typewritten copies of his production before receiving the prize, if he is requested to do so.

DEGREES CONFERRED.

HONORARY DEGREES.

June 21, 1911.

DOCTOR OF LITERATURE.—Benjamin Breckinridge Warfield, Professor of Theology at Princeton Theological Seminary, Princeton, N. J.

DOCTOR OF LAWS.—Gwilym George Davis, Professor of Orthopaedic Surgery at University of Pennsylvania, Philadelphia, Pa.; William Anthony Granville, President of Pennsylvania College, Gettysburg, Pa.

DOCTOR OF DIVINITY.—James McCullough Farr, Pastor of the First Presbyterian Church, Wilkes-Barre, Pa., John Stockton Axtell, Pastor of the Homestead Presbyterian Church, Homestead, Pa.

DOCTOR OF SCIENCE.—Benjamin Franklin Fackenthal, Jr., Riegelsville, Pa.

MASTER OF SCIENCE.—Gilbert Alexander Harvey, Buffalo, N. Y.

October 18, 1911.

DOCTOR OF LAWS.—Charles Finney Cox, Treasurer of the New York Central Lines, New York, N. Y.; Joseph Swain, President of Swarthmore College, Swarthmore, Pa.

MASTER OF SCIENCE.—Thomas J. Foster, President of the International Correspondence School, Scranton, Pa.

DEGREES IN COURSE.

June 21, 1911.

BACHELOR OF ARTS.—William Aston, Pa.; Edward Raymond Barnard, Ontario; Floyd Thomas Bower, Pa.; Edwin Clyde Fores-

man, Pa.; Horace Morgan Hess, N. J.; Raymond Solt Hittinger, Pa.; Edward Huntting Jones, N. Y.; William Cummings Kidd, Pa.; Floyd Johnson Kintner, Pa.; Jeremiah Alexander Klotz, Pa.; Jacob Servis LaRue, N. J.; John Sheridan Linn, Pa.; George McCahon, Ireland; Audley Lytle Mabon, Pa.; Stewart Rice Race, N. J.; Archibald Murray Richmond, N. J.; Arthur Dodd Snyder, Pa.; Bernice Yorgey Spare, Pa.; Elijah Compton Stewart, Pa.; Charles Benjamin Swartz, N. Y.; Ernest Mortimer Tuttle, N. J.; William Warfield, Pa.; Edmond Talmage Witt, Pa.; Clarence Ray Wolf, Pa.

BACHELOR OF PHILOSOPHY.—James Hezekiah Allen, O.; Allen Eugene Bacon, Pa.; John George Boyd, N. Y.; Robert Albert Christman, Pa.; Clarence Edgar Feick, Pa.; Samuel Goodman Hoffenstein, Pa.; Paul Hutchinson, N. J.; Omar Harrison Keller, Pa.; Samuel Bingham Luccock, Ill.; Walter Henry Mechler, Pa.; Frederick Adolphus Miller, N. J.; Jesse Spencer Parsons, Pa.; John Elmer Stellwagon, Pa.

BACHELOR OF SCIENCE.—Max Hirsch, Pa.; Christian Ludewig Siebert, Pa.

BACHELOR OF SCIENCE IN CHEMISTRY.—Henry Bunn Anderson, N. J.; Lawson Henry Bauer, Pa.; Harry Edwin Beadell, Pa.; Charles Robert Bellamy, Pa.; Frederick Luther Bentley, N. J.; Harold Croasdale, Pa.; Rollin Proctor Gilbert, N. J.

CIVIL ENGINEER.—Van Tuyl Boughton, N. Y.; William Daniel Conrad, Pa.; Donald Van Lear Downs, Del.; George Bache DuBois, D. C.; Henry Wilmot Eckel, N. J.; Theodore Sands Fillmore, Pa.; Lester Long, N. J.; Harry Worthington Mixsell, N. J.; Carl Seib Rankin, Pa.; Archibald Styer, N. J.; Harry Walter Vetter, N. J.; William Lambertson White, Jr., Pa.

MINING ENGINEER.—Roscoe Conklin Berlin, Pa.; Myron Judson Conover, N. J.; Robert Moore Eyster, Pa.; Nicholas Van Reed Hunter, Pa.; Hans Heinrich Kudlich, Pa.; Philip Maue, Pa.; Clarence Gammill Peattie, N. Y.; John Oswald Rinek, Pa.; Irvin Schick, Pa.; Guy Fuller Smith, Pa.; James Robeson Smith, N. J.; Joseph Horton Williams, Pa.; Robert Woodcock, Pa.

ELECTRICAL ENGINEER.—Frederick Heman Beeman, N. Y.; Charles Knilsey Boas, Pa.; Oliver Alexander Horner, Md.; William

Patrick Howard, Pa.; Martin Hoffman Lindabury, N. J.; Henry Stanley McGarrah, Pa.; Walter Ingham Macaulay, N. J.; Arthur Richards Miller, N. J.; James Arthur Moore, Panama; Ralph Clark Nash, O.; William Walter Perry, Pa.; John Rosenberry Rosenberry, Jr., Pa.; Jesse Earl Schelling, N. J.; Frank Carrie Shand, N. Y.

MASTER OF ARTS.—H. D. Bailey, '04.

COMMENCEMENT DISTINCTIONS, 1911.

HONORS.—Clarence Edgar Feick, Reading; Charles Benjamin Swartz, Poughkeepsie, N. Y.; Philip Maue, Hazleton; Lawson Henry Bauer, Mertztown; Carl Seib Rankin, Scranton; Stewart Rice Race, Cornish, N. J.; William Warfield, Easton.

ORATIONS.—Edmond Talmage Witt, Jemerstown; William Walter Perry, Easton; Harold Croasdale, Delaware Water Gap; John Sheridan Linn, Paoli; William Daniel Conrad, Reading; William Aston, Wilkes-Barre; Frederick Luther Bentley, Camden, N. J.; Arthur Dodd Snyder, Easton; Irvin Schick, Hazleton; Oliver Alexander Horner, Emmittsburg, Md.; John Oswald Rinek, Easton; James Hezekiah Allen, Kenton, Ohio; Floyd Johnson Kintner, Easton.

PRIZES AWARDED.

SENIOR PRIZEMEN.

THE FRANCIS A. MARCH PHILOLOGICAL PRIZE: Charles B. Swartz, Poughkeepsie, N. Y.

THE ASTRONOMICAL PRIZE: Arthur D. Snyder, Easton.

THE BASSETT PRIZE IN CIVIL ENGINEERING: Harry W. Mixsell, Phillipsburg, N. J., and William L. White, Jr., Easton.

THE B. F. BARGE PRIZE IN ORATORY: William Warfield, Easton.

THE SENIOR DEBATE PRIZES:

FIRST: Paul Hutchinson, Bayonne, N. J.

SECOND: J. Sheridan Linn, Paoli.

THIRD: Charles B. Swartz, Poughkeepsie, N. Y.

JUNIOR PRIZEMEN.

THE CLASS OF '85 PRIZE IN PHYSICS: Divided between Harry A. Lipson, Newark, N. J., and Frederick W. Maue, Hazleton.

THE BLOOMBERG PRIZE IN MODERN LANGUAGES: Harry A. Lipson, Newark, N. J.

THE SHAKESPEARE PRIZE: Herman A. Dann, Titusville.

THE JUNIOR ORATORICAL PRIZES:

FIRST: George R. Wood, St. Clair.

SECOND: John D. Lindsay, Wilmington, Del.

THIRD: Harold F. Grim, Ottsville.

SOPHOMORE PRIZEMEN.

THE TRAILL GREEN MATHEMATICAL PRIZES:

FIRST: Charles G. Eichlin, Easton.

SECOND: William N. Wysham, Baltimore, Md.

THE LOUNSBURY PRIZE IN CHAUCER: Jay I. Henshaw, Honesdale.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE: Angelo M. Centanni, Philadelphia.

THE CLASS OF '83 PRIZE IN ENGLISH: Charles G. Eichlin, Easton.

THE B. F. BARGE MATHEMATICAL PRIZES:

FIRST: John F. Magee, Easton.

SECOND: Frederick Moorby, Jamestown, N. Y.

THIRD: Divided between Louis Creveling, Bloomsbury, N. J., and Frederick W. Maue, Hazleton.

THE R. B. YOUNGMAN GREEK PRIZE: Charles G. Eichlin, Easton.

FRESHMAN PRIZEMEN.

THE LYMAN COLEMAN BIBLICAL PRIZES:

DIVISION A: Theodore W. Chandler, Scranton.

DIVISION B: Theodore Freeman, Easton.

DIVISION C: James W. Hollenbach, Reading.

DIVISION D: Douglas P. Lawall, Easton.

DIVISION E: David Paul, Maghera, Ireland.

DIVISION F: Earnest C. Watson, Washington Court House, Ohio.

THE PARK PRIZE IN LATIN: William R. Bender, East Bangor.

CLASS MONITORS.

Appointed for general excellence in study:

SENIOR CLASS: Howard L. Benson.

JUNIOR CLASS: Jay I. Henshaw.

SOPHOMORE CLASS: Earnest C. Watson.

FRESHMAN CLASS: Dwight M. Decker and William H. Woodruff.

THESES PRESENTED BY CANDIDATES FOR
DEGREES IN THE TECHNICAL COURSES
OF THE PARDEE SCIENTIFIC
DEPARTMENTS.

1. Stress Distribution in Plate Girders.
JAMES HENRY REEDER, Hughesville.
HARRY WALTER VETTER, Belvidere, N. J.
2. Design for the Development of the Proposed Site for the New
Engineering Buildings of Lafayette College.
HENRY WILMOT ECKEL, Washington, N. J.
LESTER LONG, Summit, N. J.
3. Comparison of the Tensile and Compressive Strengths of Port-
land Cement and Portland Cement Mortar.
HARRY WORTHINGTON MIXSELL, Phillipsburg, N. J.
WILLIAM LAMBERTSON WHITE, JR., Easton.
4. Comparative Strength of Round and Square Concrete Com-
pression Specimens.
DONALD VAN LEAR DOWNS, Dover, Del.
THEODORE SANDS FILLMORE, Shickshinny.
5. Trap Rock as a Grinding Material.
GEORGE BACHE DUBOIS, Washington, D. C.
6. Bonding Stress between Concrete and Steel.
CARL SEIB RANKIN, Scranton.
ARCHIBALD STYER, Burlington, N. J.
7. Lost Head in 2-inch Pipe and Valve.
VAN TUYL BOUGHTON, Valley Falls, N. Y.
WILLIAM DANIEL CONRAD, Reading.
8. Drainage of the Hazleton Coal Basin.
PHILIP MAUE, Hazleton.
IRVIN SCHICK, Hazleton.
9. Review of Mining Operations at the Mt. Hope Mine of the
Empire Steel and Iron Co., Mt. Hope, N. J.
CLARENCE GAMMILL PEATTIE, Saratoga Springs, N. Y.
ROBERT WOODCOCK, Hollidaysburg.

10. Proving of Mining Properties by the Use of the Core Drill.
ROSCOE CONKLIN BERLIN, Slatington.
MYRON JUDSON CONOVER, Matawan, N. J.
11. A Review of Tunnel Methods in the United States and Europe.
HANS HEINRICH KUDLICH, Drifton.
12. Mining Operations of the New Jersey Zinc Company at Franklin Furnace, N. J.
NICHOLAS VAN REED HUNTER, Wyncote.
ROBERT MOORE EYSTER, Chambersburg.
13. Review of the Geology, Mining and Milling at the Cornwall Ore Banks, Cornwall, Pa.
JOHN OSWALD RINEK, Easton.
JOSEPH HORTON WILLIAMS, Wellsboro.
14. Review of the Mining and Milling of the Pahaquarry Copper Company, Calno, N. J.
JAMES ROBESON SMITH, Belvidere, N. J.
GUY FULLER SMITH, Camptown, N. J.
15. Gaultherin from *Betula lenta*.
HENRY BUNN ANDERSON, Bloomsbury, N. J.
16. Metanitrosulfobenzoic Acid from Metanitrotoluene.
LAWSON HENRY BAUER, Mertztown.
17. The Chlorids of Silicon.
HARRY EDWIN BEADELL, Easton.
18. The Action of Silicon Tetrachlorid on the Sulfates.
CHARLES ROBERT BELLAMY, Scranton.
19. The Action of Silicon Tetrachlorid on the Nitrates.
FREDERICK LUTHER BENTLEY, Camden, N. J.
20. Metanitrosulfobenzoic Acid from Metanitrobenzyl Alcohol and Aldehyde.
HAROLD CROASDALE, Delaware Water Gap.
21. The Sulfonation of Orthonitroparatoluidin.
ROLLIN PROCTOR GILBERT, Camden, N. J.
22. The Construction of a Transformer Terminal Board and the Testing of Transformers.
OLIVER ALEXANDER HORNER, Emmittsburg, Md.
WILLIAM PATRICK HOWARD, Duquesne.
23. Review and Analysis of the Bellevue Sub-Station of the Lackawanna Coal Company.
FRANK CARRIE SHAND, Kingston, N. Y.

JAMES ARTHUR MOORE, Panama.

HENRY STANLEY MCGARRAH, Scranton.

24. An Investigation of the Application of Electricity to Individually Driven Machine Tools together with Tests on a Motor-Driven Lathe for Maximum Efficiency.

WILLIAM WALTER PERRY, Easton.

JOHN ROSENBERRY ROSENBERRY, JR., Easton.

JESSE EARL SCHELLING, Phillipsburg, N. J.

25. Design of a Proposed Hydroelectric Plant for the Delaware River.

WALTER INGHAM MACAULAY, Phillipsburg, N. J.

ARTHUR RICHARDS MILLER, Holland, N. J.

26. Comparative Tests of Different Makes of Mazda and Wire-Drawn Incandescent Lamps.

CHARLES KNILSEY BOAS, Harrisburg.

RALPH CLARK NASH, Warren, O.

27. Tests on a Rotary Converter.

FREDERICK HEMAN BEEMAN, Union, N. Y.

MARTIN HOFFMAN LINDABURY, Frenchtown, N. J.

THE ALUMNI ASSOCIATIONS.

The Alumni Association is composed of graduates of the College and such former students as left College before graduation, in good standing, as may be elected. The annual meeting is held on Tuesday, preceding Commencement Day.

The Association has the privilege of choosing, every alternate year, two members of the Board of Trustees, who hold office for six years. In June, 1910, A. C. Overholt, '84, of Scottdale, Pa., and Wayne Dumont, '92, of Paterson, N. J., were chosen. In the Spring of 1912 two more will be voted for.

The Executive Committee is as follows: McCluney Radcliffe, M.D., '77, Chairman, Philadelphia; A. C. Campbell, '84, Wilkes-Barre; Robert F. Whitmer, '85, Philadelphia; Fred R. Drake, '86, Easton; James W. Fox, '88, Easton; J. F. Valient, '99, New York, N. Y.; A. C. Overholt, '84, Scottdale; E. J. Kerrick, '91, Germantown; Snowden Ashford, '88, Washington, D. C.; Rev. Robert G. Leetch, '00, Far Rockaway, N. Y.; J. M. Porter, '86, Easton.

It is desirable to keep up the full record, so long maintained,

of the residences, occupations, literary efforts, and public services of the alumni and former students of the College.

Information is solicited in regard to these points, and also in reference to matters appropriate to the obituary record, which is annually prepared for the alumni association.

Each alumnus is asked to send his personal record, carefully revised to date, to the secretary before May 1, 1912.

LOCAL ASSOCIATIONS.

ALUMNI ASSOCIATION OF LAFAYETTE.

SIMON CAMERON LONG, '77, Philadelphia.....*President*
CHARLES D. MARVIN, '78, New York, N. Y.....*Vice-President*
REV. J. F. STONECIPHER, D.D., '74, Easton....*Sec. and Treasurer*

THE LAFAYETTE ALUMNI ASSOCIATION OF NORTH-EASTERN PENNSYLVANIA.

BRADLEY W. LEWIS, '71, Tunkhannock.....*President*
OSCAR J. HARVEY, '71, Wilkes-Barre.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF PHILADELPHIA AND VICINITY.

ROBT. F. WHITMER, '85, Philadelphia.....*President*
CHARLES B. ADAMSON, '77, 222 Walnut St., Phila.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF NEW YORK AND VICINITY.

WAYNE DUMONT, '92, Paterson, N. J.....*President*
JOHN F. VALIENT, 165 Broadway, New York, N. Y.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF THE WEST BRANCH.

FRED. H. PAYNE, '88, Williamsport.....*President*
R. FLEMING ALLEN, '90, Williamsport.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF CENTRAL PENNSYLVANIA.

REV. A. N. HAGERTY, '81, Carlisle.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF WESTERN PENNSYLVANIA.

GEORGE D. MCILVAINE, '90, Pittsburg.....*President*
HENRY LLOYD, JR., '03, 933 Penn Ave., Pittsburg.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF MARYLAND.

ROBERT H. SMITH, '67, 53 St. Paul Street, Baltimore, Md..*President*
PEARCE KINTZING, M.D., '81, Baltimore, Md.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF CHICAGO AND VICINITY.

NATHAN GRIER MOORE, '73, Chicago, Ill.....*President*
TRACY D. LUCCOCK, '05, 801 Manhattan Bl., Chicago, Ill..*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF THE NORTH-WEST.

HON. JAMES T. HALE, '77, Duluth, Minn.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF WASHINGTON, D. C.

SNOWDEN ASHFORD, '88, Washington, D. C.....*President*
ELI SWAVELY, '96, 4101 Connecticut Ave., Washington,
D. C.....*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF NEW JERSEY.

WAYNE DUMONT, '92, Paterson, N. J.....*President*
FREDERICK F. KENNEDY, '98, 774 Broad Street, Newark,
N. J.....*Secretary*

ASSOCIATION OF ST. LOUIS AND THE SOUTHWEST.

HON. JOSEPH P. VASTINE, '56, St. Louis, Mo.....*President*
H. P. G. COATES, '92, St. Louis, Mo.....*Secretary*

STUDENTS.

GRADUATE STUDENTS.

- S. B. Gilhuly, A.M., N. J. History and English Literature,
Lafayette, '86.
- J. B. Hench, A.M., Pa. Latin,
Lafayette, '83.
- Allan Roberts, Ph.B., M.S., Pa. . . . History and Political Science,
Lafayette, '99.
- W. M. Smith, Ph.B., Pa. Mathematics and Astronomy,
Lafayette, '03.
- William H. Kirkpatrick, A.B., Pa. . History and Political Science,
Lafayette, '05.
- Carmon Ross, Ph.B., Pa. Modern Languages,
Lafayette, '05.
- Leo A. Gates, A.B., Pa. Latin and English,
Lafayette, '08.
- Cyrus H. Williston, B.S., N. J. . . . Chemistry and Biology,
Lafayette, '08.
- Howard B. Bartolet, A.B., N. J. . . Mathematics and Physics,
Lafayette, '08.
- E. Welles Coffin, A.B., Pa. History and English,
Lafayette, '07.
- E. Graham Wilson, A.B., N. Y. . . . Psychology and Philosophy,
Lafayette, '07.
- John Royden Hess, Ph.B., Pa. . . . Chemistry,
Lafayette, '07.
- J. Sheridan Linn, A.B., Pa. English, History, and Psychol-
ogy,
Lafayette, '11.
- John Elmer Stellwagon, Ph.B., Pa. . English, History, and French,
Lafayette, '11.
- Henry Bunn Anderson, B.S. in
Chem., N. J. Chemistry and Geology,
Lafayette, '11.
- George Albert Koerber, E.E., Pa. . Physics,
Lafayette, '08.

Elijah Potter Faulconer, Jr., A.B., Ky.	
.....	Physics,
	Central Univ. of Ky., '10.
John Hawley Larned, A.B., Conn.	Modern Languages,
	Clark Univ., '08.
John Cawley, B.S., Pa.	Mathematics and Astronomy,
	Lafayette, '10.
Howard K. Preston, C.E., N. J.	Physics and Geology,
	Lafayette, '09.
William Walter Perry, E.E., Pa.	Electrical Engineering,
	Lafayette, '11.
Merrill Christy Hill, A.B., Me.	Modern Languages,
	Bowdoin, '10.
Graduates.	22

SENIOR CLASS, 1912.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Charles Matthaei Addis.....	Ch....	Newark, N. J.....	X Φ
Edward Leslie Bacon.....	C.....	Bridgeton, N. J.....	88 N.
Harold Dumont Beatty.....	L.....	Hoboken, N. J.....	109 McK.
Howard Livingstone Benson...	E.E...	Washington, D. C..	109 McK.
Ross Herman Boas.....	E.M...	Harrisburg.....	Δ K E
Benjamin Ray Brown.....	C.E...	Honesdale.....	145 P.
Ralph Waldo Brown.....	E.M...	Washington, D. C..	150 P.
Milton Oliver Cederquist.....	Ch....	Titusville.....	Φ Δ Θ
John Boyer Cline.....	C.E...	Stewartsville, N. J...	Home
Philip Lewis Cook.....	C.....	Wyalusing.....	Brd.
William Everett Crater, Jr....	L.....	Easton.....	440 Ferry
Herman Anson Dann.....	L.....	Titusville.....	X Φ
William Franklin Dannehower, Jr.....	L.....	Norristown.....	Φ K Ψ
David Davis.....	L.....	Summit Hill.....	81 N.
George R. Kaercher Day.....	E.E...	Hazleton.....	Θ Δ X
Ralph Emerson DeKay.....	C.....	Florida, N. Y.....	—
Marino Diaz.....	C.E...	Havana, Cuba.....	232 McC.
James Blair Easter.....	C.E...	Pittsburg.....	Δ K E
William Francis Farrell.....	L.....	Wilkes-Barre.....	122 McK.
George Benjamin Fillmore....	E.E...	Shickshinny.....	Δ K E
Albert James Graham.....	E.E...	Easton.....	201 Burke
Jonathan Parsons Greenleaf...	C.....	Glen Cove, N. Y.....	127 M.
Harold Fetter Grim.....	C.....	Ottsville.....	147 P.
Kenneth Cushing Grinslade...	Ch....	Leonia, N. J.....	Φ K Ψ
Floyd Johnson Hann.....	L.....	Phillipsburg, N. J.,	Home 57 Filmore
Atcheson Laughlin Hench....	C.....	Pittsburg.....	149 P.
Donald Wilson Henry.....	C.....	Athens.....	62 B.
William Vilas Hill.....	C.E...	Bordentown, N. J....	89 N.
Wilmer Jacob Hindenach....	C.....	Riegelsville.....	Home
George Maurice Hohl.....	L.....	Easton.....	214 Bushkill
John Eilenberg Howell.....	G.S...	Jersey City, N. J....	92 McK.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Robert Carter Howell.....	E.E.	Harmony, N. J.....	Home
Marshal Hunt.....	C.	Sussex, N. J.....	82 N.
Elmer Lyon Jones.....	C.E.	Scranton.....	86 N.
Paul Schell Kantner.....	L.	West Easton.....	Main St.
Michael Joseph Kasprzak.....	C.	Perth Amboy, N. J.....	173 E.
Merlin Joe Kilbury.....	G.S.	Hornell, N. Y.....	65 B.
Jacob Vanderbilt Koontz.....	C.	Baltimore, Md.....	34 S.
John David Lindsay.....	C.	Wilmington, Del.....	Δ K E
Harry Aaron Lipson.....	L.	Newark, N. J.....	85 N.
Harold John Lockwood.....	E.E.	Newton, N. J.....	69 B.
Irving Kennedy Lovett.....	L.	Little Silver, N. J.....	122 McK.
Russell McCauley.....	C.	Altoona.....	Φ Δ Θ
Kemper Grier McComb.....	C.	Haddonfield, N. J.....	115 McK.
Walter Walbridge McComb.....	L.	Tarentum.....	Φ K Ψ
George Edward McElroy.....	E.M.	Easton.....	207 Burke
Edward Heller Maier.....	C.E.	Bridgeton, N. J.....	88 N.
Ambrose Frederick Melan.....	L.	Wilkes-Barre.....	94 McK.
Robert Walton Mumma.....	E.E.	Steelton.....	107 McK.
Harry Clayton Murphy.....	C.	Vandergrift.....	X Φ
Chester Arthur Murtaugh.....	C.E.	Easton.....	60 S. Front
John Thomas Owens.....	L.	Slatington.....	23 S.
Joseph Daniel Person.....	L.	East Stroudsburg.....	147 P.
Frank Roll Powell.....	Ch.	Scranton.....	Δ K E
Walter William Propst.....	L.	Archibold.....	81 N.
William Luther Raup, Jr.....	Ch.	Milton.....	106 McK.
Austin Hunsicker Reeves.....	C.E.	Clinton, N. J.....	38 S.
Ernest William Roth.....	Ch.	Wilkes-Barre.....	74 K.
Victor Raymond Schmidt.....	C.E.	Nazareth.....	75 K.
Irving Schwed.....	L.	Somerville, N. J.....	63 B.
William Gayley Simpson.....	C.	Elizabeth, N. J.....	Φ K Ψ
John Lander Stewart.....	L.	Phillipsburg, N. J.....	6 S.
Charles Edward Straub.....	L.	Easton.....	43 S. 5th
Paul Morgan Thomas.....	C.	Lima, Ohio.....	Brd.
Stanley Judson Thomas.....	Ch.	Scranton.....	83 N.
Robert Legh Warren.....	G.S.	Shickshinny.....	137 F.
John Dorman West.....	L.	Phillipsburg, N. J.....	Home

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Charles Oliver Williamson.....	C.....	Easton, So. Delaware River Road	
John Andrew Wilson, Jr.....	C.E....	Landisburg.....	149 P.
Maurice Cleveland Wilson.....	L.....	Woodland.....	85 N.
George Rodgers Wood.....	L.....	St. Clair.....	127 M.
Leon Harold Woolsey.....	C.E....	New Paltz, N. Y.....	66 B.
SENIORS.....			72

JUNIOR CLASS, 1913.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Thomas Adams.....	C.....	Brooklyn, N. Y..	132 Cattell
Charles Daniel Addams†.....	C.E....	Bernville.....	256 Bushkill
Robert Alexander Altschuler.....	L.....	Hackensack, N. J.....	Ø K Ψ
James Burns Amberson.....	L.....	Waynesboro.....	71 B.
Charles Webster Andrews.....	E.E....	Buffalo, N. Y.....	Ø Δ X
Lorenz Kneedler Ayers.....	Ch....	Easton.....	No. 13th St.
Samuel Seymour Ball.....	E.M....	Elmira, N. Y.....	Ø K Ψ
Gordon Harold Bannerman.....	C.E....	Titusville, N. J.....	66 B.
Frederick Lucien Bird.....	C.....	Altoona.....	61 B.
Howard Milton Bliem.....	E.E....	San Antonio, Texas..	140 F.
William Miller Bond.....	C.....	Saylorsburg.....	231 Cattell
Francis Shunk Brown, Jr.....	L.....	Philadelphia.....	Z Ψ
Adam Brown Caldwell.....	C.....	Williamsport.....	35 S.
Angelo Maria Centanni.....	C.....	Philadelphia.....	174 E.
Ralph Greenfield Chapman.....	L.....	Newark, N. J.....	X Ø
Richard Douglas Cheesman.....	Ch....	Easton.....	941 Lehigh
Henry Russell Chidsey†.....	L.....	Easton....	122 Spring Garden
Isaac Carpenter Clark.....	E.M....	Takoma Park, D. C.	Ø Δ Ø
William Levin Coleman.....	C.....	Easton.....	704 Walnut
Louis Creveling.....	Ch....	Bloomsbury, N. J.....	Home
Edward Gilmore Cunningham	L.....	Sewickley.....	78 K.
Irwin Taite Darlington.....	Ch....	West Chester.....	Δ K E
George Maxmilian Dery.....	C.....	Catasauqua.....	136 F.
Raymond Herbein DeTurck.....	L.....	Oley.....	100 McK.
John Munson Doremus.....	C.E....	Gladstone, N. J.....	16 S.
Charles Garfield Eichlin.....	C.....	Easton... 1627	Northampton
Herbert Henry Eichlin.....	L.....	Easton.....	36 So. 11th
Frank Eisberg.....	C.E....	Easton.....	1145 Ferry
Morris Sloan Evans.....	C.E....	Berwick.....	Ø Δ Ø
Edwin James Fager, Jr.....	E.E....	Harrisburg.....	Ø K Ψ
Robert Cumming Ferguson†..	E.M....	New York, N. Y.....	Ø Δ Ø
Harry Clarence Fernau.....	C.E....	Jeddo.....	114 McK.
James Uhler Fetherolf†.....	L.....	Stockertown.....	Home
Jerome Edward Fishel.....	E.E....	Washington, D. C.....	47 S.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Russell Holcombe Fisher.....	L.....	Annandale, N. J.....	Home
William Edward Fitzgerald....	C.E....	Trenton, N. J.....	76 K.
James Aloysius Fleming.....	Ch....	Manchester, N. H....	150 P.
Louis Fernald Foster.....	L.....	Phillipsburg, N. J.....	Home 40 Fairview Heights
Harry Thorton Francis.....	G.S....	Titusville.....	X Ø
Thomas Armstrong Garretson..	Ch....	Perth Amboy, N. J.....	16 S.
Leslie Newton Gay.....	L.....	Shamokin.....	Δ K E
Newell Hardy Grace.....	L.....	Roslyn, L. I., N. Y.	132 Cattell
William David Gross.....	Ch....	Kingston, N. Y.....	78 K.
Robert Elliot Haas.....	L.....	Allentown.....	Ø Δ Ø
Arthur Browne Hammond, Jr..	L.....	West Chester.....	76 K.
William Oscar Hay, Jr.....	E.E....	Easton.....	15th and Northampton
Jay Irvin Henshaw.....	L.....	Honesdale.....	84 N.
George Heilman Heydt.....	E.E....	Lehighton.....	105 McK.
Herbert Moses Horne.....	C.....	Vandergrift.....	X Ø
Henry Butts Huselton.....	G.S....	Port Murray, N. J.	232 McC.
Matthew Hale Jones, Jr.....	C.....	Easton.....	Hotel Huntington
George Van Sise Keely.....	C.E....	Bayonne, N. J.....	15 S.
Lewis Hoke Kelly.....	L.....	Latrobe.....	Ø K Ψ
David Francis Kennedy†.....	L.....	Youngstown, Ohio.....	Z Ψ
Milton Paine Kitchel.....	C.E....	Boonton, N. J.....	105 McK.
Warren Woodward LaBarr....	E.E....	Winwood.....	84 N.
Paul Fisher Landis.....	L.....	Swarthmore.....	Δ K E
William Evan Lloyd, Jr.....	E.E....	Bangor.....	138 F.
Andrew McClenathen Lowry...	C.....	Dewart.....	Brd.
John Fackenthal Magee.....	E.M....	Easton.....	Paxinosa Ave.
Alexander Fulton Marshall†...	C.E....	Shamokin.....	Δ K E
Frederick William Maue.....	E.E....	Hazleton.....	29 S.
Francis Kinsey Metzgar†.....	C.E....	Phillipsburg, N. J.....	Home 71 Bennett
Hugh McCauley Miller.....	L.....	Philadelphia.....	Ø K Ψ
Frederick Moorby.....	C.E....	Jamestown, N. Y.	679 Bushkill
Harry Waters Moore.....	L.....	High Bridge, N. J.....	36 S.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Peter John Naher.....	Ch....	Scranton.....	90 N.
Harry Emil Nelson.....	L....	Altoona.....	68 B.
Gilbert Nickel.....	C....	Easton.....	17 So. 9th
Andrew Dickinson Norris†.....	G.S....	New York, N. Y.....	Δ K E
John Patrick Nugent†.....	C.E....	Troy, N. Y.....	Σ X
Charles Leonard O'Brien.....	C....	Overton.....	206 McC.
James Lee Pardee.....	G.S....	Hazleton.....	θ Δ X
Alfred Biddle Pearson.....	C.E....	Wyncote.....	Z Ψ
Charles Knauss Reinke.....	L....	Philadelphia, 821 Paxinosa Ave.	
George Andrew Reiss.....	L....	Elizabeth, N. J.....	113 McK.
Lloyd Roberts.....	L....	Slatington.....	22 S.
Edgar Hoffer Royer.....	G.S....	Greensburg.....	φ Δ θ
Harry Thomas Shannon.....	L....	Bath, N. Y.....	328 McC.
Alfred Weikel Shoemaker.....	Ch....	Allentown.....	X φ
William Michael Silfies.....	C.E....	Bath.....	———
David Bishop Skillman.....	C....	Philadelphia.....	θ Δ X
Leon Almon Smith†.....	Ch....	Camptown.....	129 M.
Alfred Leroy Spengler.....	Ch....	Easton.....	123 So. 7th
Lawrence Heck Stone.....	E.M....	Easton.....	478 Nesquehoning
Max Tischler.....	L....	Wilkes-Barre.....	67 B.
Clifford Sharp Trimmer.....	L....	Middle Valley, N. J.....	40 S.
Harry Elmer Tyson.....	Ch....	Weatherly.....	51 S.
Cornelius John Ward.....	Ch....	Phillipsburg, N. J.....	Home 21 Randall
George Raymond Waterbor....	C....	Easton.....	548 Line
Roy Pursel Wilson.....	Ch....	Phillipsburg, N. J.....	Home 68 Bullman
James Robert Winner.....	L....	Wilmington, Del.....	36 S.
Russell Henry Wohlbach.....	E.E....	Easton.....	37 So. 13th
David Ober Wolf.....	L....	Highspire.....	107 McK.
Harry Smedley Wolf.....	Ch....	Reading.....	102 McK.
Burton Guy Wood.....	Ch....	Johnstown, N. Y.....	328 McC.
Thomas Allen Wright, Jr.....	C....	Wilkes-Barre.....	Δ K E
William Norris Wysham.....	C....	Baltimore, Md.....	35 S.
John Ephraim Young.....	Ch....	Easton.....	325 McC.
JUNIORS.....			99

SOPHOMORE CLASS, 1914.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Theodore Brooks Adams†.....	C.E....	Brooklyn, N. Y.....	2 S.
Claude Mark Albert.....	M.E....	Pen Argyl.....	33 S.
Arthur Sterling Bailey.....	L.....	Lakewood, N. J.....	86 N.
Walter DeWitt Barker.....	L.....	Matawan, N. J.....	10 S.
William Raymond Bender.....	C.....	East Bangor.....	1809 Ferry
Cornelius Bergen.....	L.....	Dubuque, Iowa.....	Δ KE
Francis Shiffer Bodine.....	G.S....	Wellsboro.....	73 K.
Pierson Booth.....	C.E....	Middletown, N. Y.....	128 M.
William Albert Brightman, Jr.....	C.E....	Scranton.....	83 N.
Elwood Sandt Brinker.....	E.E....	Easton.....	415 High
Ralph Fitch Brown.....	C.E....	Honesdale.....	145 P.
Harold Robertson Bruen.....	G.S....	Rockaway, N. J.....	128 M.
Edmund Hance Carhart, Jr.....	L.....	Belvidere, N. J.....	Z Ψ
Theodore Williams Chandler.....	Ch....	Scranton.....	33 S.
Edward Granville Chesley.....	L.....	Haverhill, Mass.....	X Ø
Charles Chipman.....	G.S....	New York, N. Y.....	Z Ψ
Richard Benjamin Christie....	Ch....	Hackensack, N. J.....	37 S.
John Wellington Cleaver.....	L.....	Danville.....	146 P.
Earl Vincent Cline.....	C.....	Williamsport.....	151 P.
Stanley Howard Cline.....	E.M....	Phillipsburg, N. J., Home, R. F. D. No. 2	
John Riegel Clymer.....	E.M....	Riegelsville.....	Ø Δ X
Kenneth Hendrick Colville....	C.E....	Carbondale.....	15 S.
Charles Walter Conde.....	C.E....	High Bridge, N. J.....	41 S.
James Ray Conrad.....	C.E....	Reading.....	33 S.
Joseph Watson Craft, Jr.....	G.S....	Ambler.....	140 F.
Walter Sellew Critchlow.....	Ch....	Titusville.....	Ø Δ Ø
Spencer Danby.....	C.E....	Easton.....	Wayne Ave.
Gilbert Lane Dannehower.....	M.E....	Norristown.....	Ø K Ψ
Allan Palmer Darlington.....	E.M....	West Chester.....	45 S.
Harold Arthur Davidson.....	M.E....	Ramsey, N. J.....	Δ KE
Vergil Alvin Davison.....	E.E....	Easton.....	Prof. Davison
Samuel James DeWees.....	C.....	Reading.....	130 McC.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Bruce Miller Eaton.....	E.E...	Landisburg.....	———
Gershom Porter Ellis.....	E.E...	Avoca.....	37 S.
Paul Williams Emanuel.....	Ch....	Catasauqua.....	$\theta \Delta X$
Charles Clark Evans.....	G.S...	Berwick.....	$\phi \Delta \theta$
Stanley Richards Evans.....	C....	Moosic.....	200 McC.
Solon John Fegely.....	C....	Mertztown.....	100 McK.
James Watson Foresman.....	E.E...	Williamsport.....	Z Ψ
William Hale Francisco.....	C.E...	Easton.....	———
Theodore Freeman.....	L....	Easton.....	501 Lafayette
William Ward Frick.....	M.E...	Pittsburg.....	$\theta K \Psi$
John Henry Gaffin.....	C.E...	Wyoming, N. Y.....	———
Frederick Conrad Gamsu.....	C.E...	Arverne, L. I., N. Y.,	50 No. 9th
Earl DuTot Gardner.....	L....	Easton.....	808 Northampton
William Henry Goodwill.....	L....	Shamokin.....	24 S.
William Gould Gould.....	E.M...	Easton.....	746 Washington
John Summerfield Green, Jr...G.S...	Gittings, Md.....	11 S.	
Milton Conrad Ham.....	L....	Millbrook, N. Y.....	133 M.
Arthur Brooks Hampson.....	G.S...	Nazareth.....	———
Henry Stephenson Hampson...	G.S...	Nazareth.....	———
Howard Hanks.....	C.E...	Ridgewood, N. J....	———
Chauncey LeBar Hart.....	G.S...	Pennington, N. J....	———
Francis Darlington Hart.....	C.E...	Los Angeles, Cal.,	———
Harold Pauli Heil.....	C.E...	Easton.....	106 Cattell
William Albert Herr.....	L....	Hazleton.....	161 E.
John Wills Herron.....	L....	Peoria, Ill.....	Z Ψ
Horace Kratz Hiestand.....	L....	Palm.....	170 E.
William Rodney Holbert.....	L....	Warrington.....	11 S.
James Walter Hollenback....	Ch....	Reading.....	133 M.
Harry Edward Jones.....	C.E...	Waterbury, Conn....	175 E.
John George Keeler.....	E.E...	LeRaysville.....	129 M.
Robert Volk Kiehner.....	L....	Collingswood, N. J....	42 $\frac{1}{2}$ S.
Frank Boone Kelly.....	E.E...	Pitman, N. J.....	130 McC.
Gordon Arnold Kelly†.....	Ch....	Easton.....	128 No. 2d
Dyson Armstrong Kennedy....	L....	Lansdowne....	———
Raymond Anthony Ketchledge C....		Easton... 1131 Northampton	

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
John Carl Kielman.....	M.E...	Portsmouth, Ohio,	Prof. Hardy
Thomas Lester Killough.....	L.....	Elizabeth, N. J.....	50 S.
John Knight.....	C.E...	Summit, N. J.....	45 S.
Frederick Louis Kolb.....	E.E...	Scranton.....	90 N.
Clarence Albert Kresky.....	L.....	Scranton.....	108 McK.
Harold Samuel Laird.....	C.....	West Chester.....	134 M.
Russell Keller Laros.....	E.E...	Easton.....	410 Porter
Douglas Perkins Lawall.....	L.....	Easton.....	69 No. 2d
Benjamin Lewis.....	C.E...	New York, N. Y.....	166 E.
John Roland Lounsberry.....	G.S...	Branchport, N. Y.,	614 Coleman
LeRoy Gilbert Lugar.....	L.....	Ashbourne.....	131 M.
Robert Chesebrough McCorkle.....	G.S...	New York, N. Y.....	Ø K Ψ
Thomas Francis McDonald, Jr.....	L.....	Stroudsburg.....	44 S.
David Burrell McWilliams.....	C.E...	Mifflinburg.....	37 S.
Walter Seeley Mallory, Jr.....	M.E...	Easton.....	Ø Δ X
John Wesley Magee.....	E.E...	Easton... Meixsell and Pierce	
John William Mann.....	L.....	Stockertown.....	Home
Edward Dodd Mead.....	Ch...	Newark, N. J.....	45 S.
William Cassidy Mecray.....	C.E...	Cape May City, N. J.....	169 E.
Eugene Kearfott Miller.....	E.M...	Scottdale.....	Ø Δ X
Fred Nathan Miller.....	C.....	Easton.....	414 McC.
Russell Cline Miller.....	C.....	Phillipsburg, N. J.....	Home, R. F. D. No. 2
Hobart Condit Mitchell.....	E.E...	Boonton, N. J.....	98 McK.
William McKee Moffat.....	C.....	Fort Wayne, Ind.....	136 F.
William Augustave Moore.....	L.....	Trenton, N. J.....	Ø Δ Ø
Charles Conyngham Morgan.....	L.....	Wilkes-Barre.....	114 McK.
Floyd Jackson Palmer.....	C.....	Pen Argyl.....	97 McK.
David Paul.....	L.....	Maghera, County Derry,	Ireland, Geo. Simon's
Chester Gordon Peck.....	Ch...	Perth Amboy, N. J.....	49 S.
Leonard Carlton Peckitt.....	Ch...	Catasauqua.....	Ø Δ X
Edward Francis Penrose.....	L.....	West Chester.....	134 M.
John Pfromm.....	Ch...	Hazleton.....	51 S.
Roger Prosser.....	L.....	Minersville.....	113 McK.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
William Clarence Pryce.....	C.....	Ebensburg.....	42 S.
Robert Leon Rankin.....	L.....	Berlin, N. J., George Simon's	
Frank Joseph Reiser.....	L.....	Hollidaysburg.....	701 High
James Thomson Reside.....	C.E...	Salem, N. J.....	99 McK.
Roland Grant Richmond.....	C.....	Boonton, N. J.....	99 McK.
Lewis Robbin.....	L.....	Steelton.....	212 McC.
Joseph Seitz Rodenbough....	L.....	Easton.....	410 Clinton
Johnston Wilbur Roling.....	L.....	Easton.....	900 Butler
James Hiatt Salmon.....	C.E...	Scranton.....	108 McK.
Charles Abram Secor†.....	C.E...	Arlington, N. J.....	34 S.
Abraham Jacob Segal.....	L.....	Scranton.....	164 E.
Howard Leidy Shimer.....	E.E...	Easton.....	1005 Ferry
John Morris Shimer.....	E.E...	Easton.....	812 Ferry
Samuel Mutchler Shipman....	L.....	Paxinosa.....	24 S.
Talbot Quarrier Shrewsbury...	E.M...	New York, N. Y.....	69 B.
Burton Sturdevant Shupp....	L.....	Wilkes-Barre.....	28 S.
Moses Hiles Simmons.....	E.E...	Hamburg, N. J.....	72 B.
Russell McCauley Smiley.....	L.....	Altoona.....	77 K.
Vincent Robinson Smith.....	L.....	Scottdale.....	θ Δ X
Ward Mahlon Snyder.....	L.....	Easton.....	244 Bushkill
John Lang Speer.....	G.S...	Vandergrift.....	X ϕ
Carl Caskey Speidel....	L.....	Washington, D. C...	116 McK.
Frederick Hiram Spotts.....	C.....	Williamsport.....	151 P.
Frederick Josiah Spry.....	C.E...	Kingston.....	176 E.
Thomas Findley Steele†.....	C.E...	Shamokin.....	607 High
Ellwood Hamilton Stiver.....	Ch...	Nazareth.....	—
Abram Strausburg.....	L.....	Easton....	741 Northampton
Howard Villeroy Swartz.....	M.E...	Poughkeepsie, N. Y...	—
William Grant Taggart.....	C.E...	Fracksville.....	12 S.
Roger Lockwood Totten.....	L.....	Jersey City, N. J...	116 McK.
Thomas Wayne Trembath....	L.....	Kingston.....	28 S.
William Wagenhurst.....	M.E...	Norristown.....	230 McC.
Earnest Charles Watson.....	L.....	Columbus, Ohio....	97 McK.
Francis Walton Wolff.....	C.E...	Newark, N. J...Geo. Simon's	
Gilbert Allan Woods.....	L.....	Easton.....	Hotel Karlton
Andrew Young.....	L.....	Irvington, N. J.....	98 McK.
SOPHOMORES.....			136

FRESHMAN CLASS, 1915.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
John Quincy Adams.....	C.E...	Easton...819	Spring Garden
Stuart Welsh Adler.....	L....	Passaic, N. J.....	79 N.
Julian Alcalde.....	C.E...	Brooklyn, N. Y...	132 Cattell
Alcides Miguel Alcazar.....	E.E...	Corocoro, Bolivia, South America.....	609 High
Chester Homer Allen.....	L....	Buttzeville, N. J.....	—
William Ruthrauff Amberson .	L....	Waynesboro.....	100 Cattell
Arthur Hammond Amick, Jr...	G.S...	Cumberland, Md.....	27 S.
Edgar Maurer Anderson.....	M.E...	Jersey City, N. J.....	130 M.
Harold William Anderson.....	G.S...	Paterson, N. J.....	72 B.
William Ross Andre.....	L....	Stroudsburg.....	44 S.
Ross Quay Augustine.....	L....	Uniontown.....	θ Δ X
Harold Wilbur Bailey.....	E.E...	Milburn, N. J.....	101 McK.
Jacob Franklin Bell.....	G.S...	Canonsburg.....	—
John Winfield Bennett.....	L....	Patchogue, N. Y.....	5 S.
Walter Sterling Biddle, Jr....	G.S...	Wilkes-Barre.....	Z Ψ
Andrew Gustave Bisset.....	C.E...	Washington, D. C.....	79 N.
Harry Nelson Bockus.....	G.S...	Gouverneur, N. Y....	Δ K E
Willard Harry Bond.....	G.S...	Brooklyn, N. Y.....	2 S.
Henry Christopher Booth.....	C.E...	Wilkes-Barre.....	509 High
Charles Sherwood Boyce.....	C.E...	Binghampton, N. Y...	φ K Ψ
Edwin Douglas Boyce.....	C.E...	Binghampton, N. Y...	φ K Ψ
Edward Daniel Brannon.....	C....	Hazleton.....	50 S.
George Garwood Brown.....	G.S...	Lakewood, N. J....	608 New
John Kenneth Brownback....	G.S...	Linfield.....	—
Wilbur Aaron Bryan.....	L....	Hackettstown, N. J.	232 McC.
Richard Griffith Burn.....	L....	Oxford.....	148 P.
Henry Lovell Carr.....	C.E...	New York, N. Y.....	Δ K E
Edward Smith Chamberlain....	E.M...	St. Louis, Mo.....	—
Charles Samuel Clark.....	C.E...	Binghamton, N. Y....	—
Walter Horace Clark.....	E.E...	Easton.....	523 Wilkes-Barre
Paul Leo Clugston.....	L....	Waynesboro.....	106 McK.
George Aloysius Collins.....	L....	Wilkes-Barre.	181 St. Joseph

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
William Hazel Collins.....	E.M...	Washington, D. C.....	X 0
James Low Colt.....	Ch...	Lancaster, N. Y.....	119 McC.
Howard Strong Conklin, Jr....	E.E...	Patchogue, N. Y.....	152 P.
Harry Abner Cook.....	E.E...	Easton.....	200 McC.
Donald Otto Coughlin.....	L.....	Luzerne.....	314 McC.
Charles Markley Crawford....	G.S...	Ironton, Ohio.....	121 McK.
John Copeland Crozier.....	C.E...	Milburn, N. J.....	154 E.
William Lewis Cunningham....	Ch...	Pittsburg.....	601 High
Lester Marshall Curtis.....	Ch...	Norfolk, Conn.....	27 S.
Aaron Haven Dale.....	C.E...	Scranton.....	0 K P
Charles Junkin Davenport....	E.E...	Wilkes-Barre.....	14 S.
Frederick King Davidson.....	Ch...	Boonton, N. J.....	157 E.
Robert Watkins Davies.....	L.....	Easton.... 14th and Bushkill	
Merrill Boswell Davis.....	L.....	Boonton, N. J.....	171 E.
Dwight Moody Decker.....	Ch...	West Pittston.....	701 High
Joseph Francis Deegan.....	L.....	Perth Amboy, N. J....	173 E.
John Willard DeFord.....	G.S...	Youngstown, Ohio..	136 McC.
Edwin Grafting Dewis.....	G.S...	Ocean Grove, N. J.....	39 S.
Joseph Ignatious Diamond....	G.S...	Cynwyd.....	89 N.
Edwin Augustus Dickinson....	L.....	Ligonier.....	—
Theodore Mulford Doan.....	G.S...	Berwick.....	—
Warren Gore Donaldson, Jr....	G.S...	Trenton, N. J.....	75 K.
Chalmer John Durand.....	Ch...	Easton.....	121 So. 14th
William Lukens Edwards.....	C.E...	Lansdale.....	163 E.
John James Egan.....	L.....	Trenton, N. J.....	130 McC.
Raymond Thos. Eichelberger..	Ch...	Everett.....	73 K.
Robert Edmonston Ellis.....	M.E...	Paterson, N. J.....	115 McK.
Harvey Jones Elwell.....	L.....	West Haven, Conn....	41 S.
William Johnson English, Jr....	E.E...	Ocean Grove, N. J.....	39 S.
Frank Arthur Ernst.....	C.E...	Hoboken, N. J.....	101 McK.
Frank Marchand Everson.....	G.S...	Pittsburg.....	0 Δ X
Henry Rudolph Finger.....	L.....	Wilkes-Barre.....	74 K.
Samuel Brown Fleming.....	C.E...	Easton.....	830 McC.
Willis Austin Flory.....	M.E...	Bangor.....	118 McK.
George Swift Freeman.....	E.E...	Easton.....	501 Lafayette
Edgar Miller Furry.....	G.S...	Altoona.....	X 0
Wilson Baughman Gaither....	L.....	Greensburg.....	Δ K E

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
James Russell Gardner.....	C.E...	Scranton.....	701 High
Donald Able Geiser.....	C.....	Easton.....	Paxinosa Ave.
William McKee German.....	C.....	Pittsburg.....	Ø K Ƴ
Dudley Able Giberson.....	L.....	Easton.....	246 Bushkill
Alexander Harrison Gillespie...	G.S...	Troy, N. Y.....	Σ X
Benjamin Goldberg.....	L.....	Trenton, N. J.....	130 McC.
Gerald Garner Grant.....	M.E...	New York, N. Y.....	130 M.
Karl Franklin Gray.....	E.E...	Easton....	113 Northampton
George Leslie Griffith.....	E.E...	Clover Hill, N. J.....	48 S.
Vaughan Hatfield Griffith....	L....	Rutherford, N. J.....	Ø K Ƴ
Ernest Carlyn Guy.....	L....	Washington, D. C....	Ø Δ X
Martin Thomas Hagerty, Jr....	G.S...	Phillipsburg, N. J., Home, Fairview Heights	
Benjamin Taylor Hale, Jr....	G.S...	Towanda.....	137 F.
Harold Gutelius Hall.....	M.E...	Bloomsburg.....	—
Edgar Thomas Hammer.....	L.....	Greensburg.....	Ø Δ Ø
William Joseph Happel.....	L.....	Tatamy.....	Home
Harvey Taylor Harrison.....	E.M...	Pittsburg.....	X Ø
Ralph Waldo Harrison.....	C.E...	Brooklyn, N. Y.....	—
Herbert Newlin Hartman....	C.....	Wilmington, Del.	Geo. Simon's
Mathias Saxman Hartman....	G.S...	Latrobe.....	139 F.
Gilbert Herr Hassler.....	Ch....	Philadelphia.....	—
George Ezra Hawkins.....	E.E...	Centre Moriches, N. Y.	152 P.
Emory Wilbur Helfrich.....	G.S...	Pleasantville, N. J.....	X Ø
James Monroe Hess, Jr.....	L.....	East Mauch Chunk..	94 McK.
Ralph Blake Hindman.....	C.....	Chillicothe, Ohio....	601 High
Randall Francis Holden.....	C.E...	Washington, D. C....	62 B.
Joel Grant Holmes.....	E.E...	Forked River, N. J.....	Z Ƴ
Charles Wood Horr.....	L.....	Newark, N. J.....	Ø Δ X
Leonard Ira Houghton.....	G.S...	Walpole, N. H.....	159 E.
Alfred Lobb Jeffery.....	C.....	Pen Argyl.....	168 E.
Harold West Johnson.....	C.E...	Sparrowbush, N. Y....	153 E.
Howard Riegel Johnson.....	L.....	Riegelsville.....	Home
George Edward Johnston.....	G.S...	Akron, Ohio.....	Ø Δ Ø
Joseph Jack Johnston.....	C.E...	Akron, Ohio.....	Ø Δ Ø
William Harrison Johnston....	C.....	Philadelphia....	Geo. Simon's
Robert Thompson Johnstone..	G.S...	Titusville.....	Ø Δ Ø

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Alexander Weikel Jordan.....	E.M...	Easton.....	1055 Butler
William George Keat.....	M.E...	Pen Argyl.....	167 E.
James Henry Kennedy.....	E.E...	Lansdowne.....	80 N.
Jesse Lloyd Kenworthy, Jr....	L....	Coatesville.....	608 New
John R. Kenyon.....	C.E...	Binghamton, N. Y.....	80 N.
Joseph Homet Kerrick.....	E.M...	Germantown.....	—
Allan Price Kirby.....	G.S...	Wilkes-Barre.....	—
Harold Custer Kressler.....	M.E...	Bangor.....	131 M.
George Washington Krick....	C.E...	Richmond Hill, N. Y.,	121 McK.
Karl Ferdinand Kuebler.....	Ch...	Easton.....	—
Minor Crawford Lake.....	E.E...	Newark, N. J.....	—
Wilbur Arthur Langdon, Jr....	Ch...	Allentown.....	117 McK.
Nelson David Langenbach....	Ch...	Easton.....	R. D. No. 2
Frazier Wellwood Lathrope....	C.E...	Carbondale.....	3 S.
George Abraham Laubach, Jr....	L....	Easton.....	133 No. Second
Gordon Lee.....	C.E...	Carbondale.....	14 S.
Paul Morley Lee.....	E.E...	Middletown, N. Y.....	12 S.
Harry Mulford Leek.....	L....	Amagansett, N. Y.....	5 S.
LeRoy Lefferson.....	C.E...	Manasquan, N. J.....	65 B.
Horace Algert Lehr.....	C....	Easton.....	1144 Butler
John Seivel Leister.....	C.E...	Reedsville.....	10 S.
Alexander Leiter.....	E.E...	Wilkes-Barre.....	—
Grover Cleveland Lesser.....	E.M...	Upper Lehigh.....	314 McC.
Egbert Thompson Lloyd.....	C.E...	Washington, D. C....	—
Russell Fairchild Lloyd.....	L....	Bangor.....	146 P.
Arthur Jefferson Lockard.....	Ch...	Easton.....	102 Cattell
Charles Raymond Lohman....	E.E...	Kingston.....	231 Cattell
John Frederick Luhr.....	C.E...	Roselle Park, N. J.....	230 McC.
Cornelius John McCarthy.....	C.E...	Shamokin.....	Δ K E
Henry Cordier McDonald.....	G.S...	Pittsburg.....	X Ø
Edmund Philip McGrath.....	G.S...	Worcester, Mass.....	—
Robert Dallas McManigal....	E.E...	Logan, Ohio.....	231 Cattell
Warren Bryan Mack.....	L....	Flicksville.....	317 No. 9th
George Bushar Markle, Jr....	M.E...	Hazleton.....	705 High
Edward John Fox Marx.....	L....	Easton... 8 Chestnut Terrace	
John Alpheus Matthews.....	Ch...	Altoona.....	77 K.
Albert Willis Maue.....	C.E...	Hazleton.....	29 S.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
John Maxwell.....	C.....	Easton.....	612 Cattell
Otto May.....	L.....	Pittsburg.....	68 B.
Ernest Martin Meier.....	L.....	Easton.....	927 Washington
Arthur Leon Meyer.....	Ch....	Trenton, N. J.....	$\emptyset \Delta \emptyset$
Chester Powers Metzger.....	C.E....	Glen Gardner, N. J..	Home
Carl Nicholas Miller.....	Ch....	Bangor.....	118 McK.
Frank Pearsol Miller.....	E.E....	Scottdale.....	$\emptyset \Delta X$
George Roland Miller, Jr.....	C.....	Easton.....	323 High
Gardner Masten Montgomery..	M.E....	Buffalo, N. Y.....	—
Charles Byron Morgan.....	G.S....	Wilkes-Barre.....	Z Ψ
Gerald Amos Morgan.....	C.E....	Harrisburg.....	$\emptyset \Delta \emptyset$
Robert Swan Mueller.....	L.....	Pittsburg.....	$\emptyset \Delta X$
Robert Axford Osthaus.....	L.....	Scranton.....	110 McK.
George Torrence Overholt....	L.....	Scottdale.....	X \emptyset
Schuyler Pardee.....	E.M....	Hazleton.....	$\emptyset \Delta X$
John Heiks Paul.....	E.E....	New Kingston.....	110 McK.
Maurice Peacock.....	Ch....	Germantown.....	Z Ψ
Howard Kistler Petry.....	L.....	Wilkes-Barre.....	314 McC.
Courtney Beach Phillips.....	G.S....	Kingston.....	—
George William Porter.....	L.....	Greensburg.....	711 High
William Hunter Powell.....	E.E....	Wyncote.....	Z Ψ
Lewis Matten Prutzman.....	L.....	Hamburg.....	232 McC.
Shipman Roseberry Pursel....	C.E....	Phillipsburg, N. J.,	Home,
			R. F. D.
LeRoy Edward Putnam.....	G.S....	Newark, N. J.....	X \emptyset
William Rockefeller Rasquin..	C.E....	Flushing, N. Y.....	$\Delta K E$
Freeman Leigh Rawson.....	E.E....	New York, N. Y.....	—
Barron Peard Rex.....	L.....	Rumson, N. J.....	130 McC.
Jules Darius Roberts, Jr.....	M.E....	Dallas, Texas.....	3 S.
Roy Thomas Robling.....	C.....	Moosic.....	132 Cattell
Harold Montgomery Romig....	C.E....	Easton.....	225 No. 10th
Carlton Wallace Rose.....	C.E....	Princeton, N. J.....	—
Carl Fawcett Scharpf.....	L.....	Coraopolis.....	162 E.
Ralph Andrew Schilling.....	E.M....	Easton.....	208 No. 7th
William Erwin Schmertz.....	L.....	Pittsburg.....	$\emptyset \Delta X$
Granville Elwood Schug.....	E.M....	Easton.....	—
Arthur Anders Schultz.....	Ch....	Norristown.....	709 High
Walter James Scott.....	L.....	Collingswood, N. J.	609 High

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Frank Jacob Seibert.....	Ch....	Easton.....	640 Wolf
William Herbert Seiple.....	L....	Easton.....	74 No. 4th
Edw. Rockingham Shackleton.....	G.S....	Troy, N. Y.....	Σ X
Ralph Faust Shaner.....	L.S....	Pottstown	162 E.
Paul Colver Shoemaker.....	Ch....	Allentown.....	117 McK.
William Cecil Short.....	Ch....	Easton....	1312 Washington
Harold William Sloyer.....	Ch....	Easton.....	R. D. No. 6
Monroe Wilson Sloyer.....	L....	Easton.....	R. D. No. 4
Arthur Mathias Smith.....	Ch....	Berwick.....	711 High
Ernest Elwin Smith.....	E.E....	Lehighton.....	165 E.
Gerald Barcroft Smith.....	L....	Clinton, N. J.....	Home
Howard Arthur Smith.....	M.E....	Easton.....	——
Sylvester Comstock Smith, Jr.....	C.E....	Phillipsburg, N. J., Home,	97 So. Main
William Blair Smith.....	Ch....	Belvidere, N. J.....	——
Foster Byron Snowden.....	L....	Conemaugh.....	139 F.
Robert Smith Soles.....	E.E....	McKeesport.....	Φ K Ψ
Paul Virchow Spear.....	G.S....	Vandergrift.....	X Φ
Frank Joseph Spengler.....	G.S....	Easton.....	——
John Elwyn Spiegel.....	L....	Detroit, Mich.....	X Φ
Stanley Caswell Spiegel.....	G.S....	Detroit, Mich.....	X Φ
William Joel Spry.....	L....	Plymouth.....	176 E.
Millard Fillmore Staples.....	C....	Stroudsburg.....	X Φ
Chauncey Julius Strickland.....	Ch....	Roselle, N. J.....	——
Frank Marshall Sweeny.....	C.E....	Baltimore, Md.....	608 New
William Perry Tallman.....	L....	Phillipsburg, N. J., Home,	35 Bullman
Leon DeHirst Teal.....	C.E....	Cold Springs, N. J.....	609 High
Lewis Grant Teetsell.....	Ch....	Tarrytown, N. Y.....	87 N.
James Donohoe Toole.....	L....	Minersville.....	138 F.
Floyd Walter Uhler.....	L....	Stockertown.....	Home
*Victor DeLara Valdes.....	M.E....	Asbury Park, N. J.....	——
Lyman Charac VanInwegen.....	E.E....	Hugenot, N. Y.....	155 E.
Donald Weidman Vaughters.....	L....	Chillicothe, Ohio.....	23 S.
Lamar Shepard Voorhees.....	G.S....	Newton, N. J.....	102 McK.
Joseph Michael Walsh.....	L....	Wilkes-Barre.....	509 High
Harold Edmund Walter.....	Ch....	Philadelphia.....	——

* Died January 5, 1912.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
George Willever Walton.....	L.....	Berwick, 9 Sitgreaves, Phillipsburg, N. J.	
Oakley Emerson Washburn....	L.....	Saugatuck, Conn....	424 McC.
James Jamison Waygood.....	L.....	Oak Lane.....	Φ Δ Θ
James Holman Weir.....	E.E....	Natalie.....	87 N.
Benjamin Harrison Welty.....	L.....	Waynesboro.....	Φ Δ Θ
Charles McVeigh Willets.....	G.S....	Philadelphia.....	— — —
Henry Baron Welty.....	G.S....	Greensburg.....	Φ Δ Θ
Lea Daneuhower Williams....	G.S....	Washington, D. C....	92 McK.
Edward Bradford Williston. .	Ch....	Phillipsburg, N. J., Home, 569 So. Main	
William Harold Winner.....	C.....	Wilmington, Del.....	43 S.
Urbanus Short Wirebach.....	L.....	Easton.....	625 Berwick
Russell Stanley Woglom.....	L.....	Perth Amboy, N. J.....	49 S.
William Harrison Woodruff....	L.....	Green Village, N. J., 1440 Washington	
Harold John Woodward.....	L.....	Cookstown, N. J....	93 McK.
Willard Wright.....	C.....	Worcester, N. Y....	509 High
Lewis Benjamin Wyckoff.....	C.E....	Asbury Park, N. J....	43 S.
Frank Clurihew Wymond.....	E.E....	Highland Park, Ill.....	Z Ψ
FRESHMEN.....			231

ABBREVIATIONS FOR BUILDINGS AND COURSES OF STUDY.

Brd.—Brainerd Hall.
 B.—Blair Hall.
 E.—East Hall.
 F.—Fayerweather Hall.
 K.—Knox Hall.
 M.—Martien Hall.
 McC.—McCartney St.
 McK.—McKeen Hall.
 N.—Newkirk Hall.

P.—Powell Hall.
 S.—South College.
 $\Delta K E$ —Fraternity House.
 ΣX —Fraternity House.
 $\theta \Delta X$ —Fraternity House.
 $\phi \Delta \theta$ —Fraternity House.
 $\phi K \psi$ —Fraternity House.
 $Z \psi$ —Fraternity House.
 $X \phi$ —Fraternity House.

C.—Classical.
 C.E.—Civil Engineering.
 Ch.—Chemical.
 E.E.—Electrical Engineering.

E.M.—Mining Engineering.
 G.S.—General Scientific.
 L.—Latin Scientific.
 M.E.—Mechanical Engineering.

† Reciting on schedule.

— Absent at time of publication of catalogue.

SUMMARY.

Courses.	Seniors.	Juniors.	Sophomores.	Freshmen.	Total.
Graduates.....					22
Classical.....	18	17	14	14	63
Latin Scientific.....	22	30	45	66	163
General Scientific.....	3	5	12	38	58
Civil Engineering.....	12	15	26	38	91
Electrical Engineering..	7	10	14	27	58
Mining Engineering.....	3	5	6	9	23
Mechanical Engineering..	..	..	8	12	20
Chemical	7	17	11	27	62
Totals.....	72	99	136	231	560

CLASSIFICATION BY RESIDENCE (Non-graduates).

California	1	Maryland	5	Ohio.....	11
Connecticut	4	Massachusetts...	2	Pennsylvania...	320
Delaware	4	Michigan	2	Texas.....	2
Dist. of Columbia	11	Missouri.....	1	Cuba.....	1
Illinois	2	New Hampshire	2	Ireland.....	1
Indiana.....	1	New Jersey	114	South America..	1
Iowa.....	1	New York.....	52		

For further information, address "The Registrar, Lafayette College, Easton, Pennsylvania."



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